Dental Abstracts

a selection of world dental literature

AMERICAN DENTAL ASSOCIATION

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AMERICAN DENTAL ASSOCIATION

Sections

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Oral surgery

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Surgical technics

Maxillofacial burns caused by accidents or electricity: correction by plastic surgery

(Verletzungen durch elektrische Unfälle im Kiefer-Gesichtsbereich und ihre plastische Versorgung)

J. Gabka. *Deut. zahnärztl. Ztschr.* 10:1165-1174 Sept. 1, 1955

In most instances of maxillofacial burns caused by accidents or electricity, children are involved. One out of every three deaths in children between the ages of one to ten results from such accidents. In the final treatment, the plastic surgery involved enters into the field of dentistry, since it deals with the intraoral or extraoral reconstruction of maxillofacial deformities, including plastic replacement by implantation of the destroyed parts. The intraoral method is used to restore the impeded oral function and to correct speech defects; the extraoral technic for the reconstruction in accordance with esthetic principles.

Case 1. The patient, a four year old girl, suffered an unusual burning in the maxillofacial region through an accident (Fig. 1). A short circuit had necessitated the use of candles. A wax candle tumbled onto the child causing second and third degree burns on face and breast. The lower anterior teeth and gingiva were exposed. As a result of the severe charring, the scar formation had fused the skin of the cheek to that of the breast. Scars also appeared in the facial region from the nose to the left ear (Fig. 1). In addition to the injuries of the soft parts, including the tongue, a palatal perforation was observed approximately 1.5 cm. wide, in the posterior crest of the alveolar ridge (Fig. 1). The macroscopic examination revealed that no devitalization or destruction of teeth had occurred. The therapy consisted of reconstruction of destroyed soft and hard tissues by plastic surgery.

Figure 1 Case 1. Left: Before primary plastic surgery. Center: Before final operation. Right: Palatal perforation

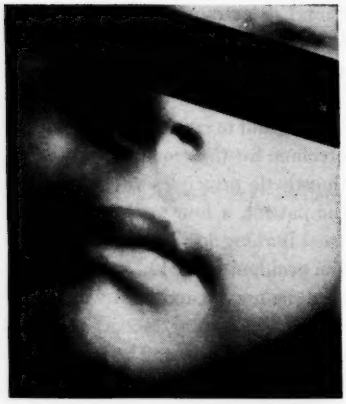

Figure 2 Case 3. Enclave on upper lip (after primary surgery)

Case 2. The patient, a five year old boy, sustained third degree burns through an accidental contact with the wall plug of a radio (220 volt alternating current). The examination revealed a granulation on the upper lip and a partial destruction in the anterior palatal region. Therapy consisted of primary plastic surgery of both lips by the Delormes' method; in a secondary operation, the closure of the palatal perforation will be completed.

Case 3. The patient, a one year old girl, burned both lips and the tongue by playing with the contact point of an extension cord. Therapy was similar to that used in Case 2. The present condition of the patient shows a small enclave of the lip corner (Fig. 2); a secondary operation using a V-shaped implantation will be necessary.

Case 4. The patient, a one year old boy, was injured severely through putting a live wire into his mouth and nose. Figure 3, left and right, shows the third degree burns before and after plastic surgery.

Examination revealed a tight, scarred upper lip adherent to the crest of the alveolar ridge. Some of the soft tissues had been destroyed completely. There also was a fracture of the symphysis. The remains of the upper lip were flabby, and the facial contour on both sides was distorted. The upper jaw also had been fractured, and a large portion of the alveolar bone was missing. The inferior turbinate was protruding 2 cm. through the palatal perforation, and even the gentlest palpation was extremely painful.

The primary operation was directed toward the necessary enlargement of the labial sulcus by skin graft and the removal of the turbinated bone. The skin graft was maintained in the sulcus with a modeling plastic mold to hold the graft in position. The palatal perforation was closed by suturation. Roentgenograms, taken four months later, showed no unfavorable changes.

In most instances of facial deformities, the reconstruction of the destroyed parts by plastic surgery is indicated. When such surgery is contraindicated because of the extent of the injuries or the condition of the surrounding tissues, the immediate extraoral closure (Fig. 3) is preferred, at least as a temporary procedure, until the final operation can be performed.

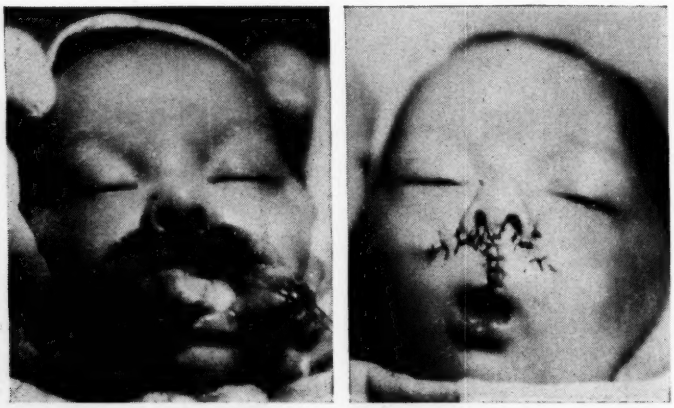

Figure 3 Case 4. Third degree burns before and after plastic surgery

A review of sterilization and disinfection in dentistry

M. R. Holland. *Oral Surg.,Oral Med.&Oral Path.* 8:788-795 Aug. 1955

Although the oral cavity is contaminated with pathogenic bacteria, it is important, nevertheless, that oral surgeons practice surgical disinfection to prevent cross-infections and the introduction of extraneous bacteria to which surgically traumatized tissues may respond unfavorably. Sterilization implies destruction of all bacterial life; disinfection denotes that only organisms capable of causing infection are destroyed. Moist heat is the most efficient means of destroying bacteria. Steam under pressure and boiling water are the methods of choice for sterilizing instruments. Chemical disinfection is preferred only when moist heat might injure delicate, cutting-edged instruments.

Care of the dentist's hands, preparation of the operative field, and disinfection and storage of instruments are discussed. It is particularly important to sterilize needles and syringes, for if pathogenic bacteria are carried deep into a puncture wound, serious deep infections may result. Infectious hepatitis and homologous serum jaundice may be spread by improper sterilization of needles. These viruses can be transferred from patient to patient, and the diseases they cause are occupational hazards of medical and dental personnel. After the instruments have been sterilized, they should be stored between sterile towels in a dust-free cabinet. Instruments not used frequently should be removed from the storage cabinet and disinfected at regular intervals.

Therapy of prognathism by surgery

(Terapia chirurgica nel prognatismo)

G. Tullio. *Riv. ital. stomat.* 10:985-1030 Sept. 1955

The human body constitutes a functional entity. No alteration in any part can occur without causing changes in other parts. The facial skeleton and the dentition are functional sections of the skull; when variations in occlusion appear, there also will be variations in the facial and cranial structures.

Four subdivisions of dentistry are involved in the therapy of prognathism: dental pathology, orthodontics, prosthetics and oral surgery.

The anthropologist designates prognathism as an indication of a forward projection of the upper jaw, but since the Greek word *gnathos* strictly signifies the lower jaw, the term prognathism should be used for the marked projection of the mandible, especially in malocclusions (Angle's Class III). In many instances of this anomaly (mesioclusion), it is difficult to establish the etiologic factors. It seems evident that even roentgenology cannot provide more data than those already known through biologic investigations. Considered from the ontogenic viewpoint, one of the important differences between man and other mammals is the fact that the human cranium does not undergo the same developmental changes as, for instance, occur in the apes. Morphologically, man and ape are more closely related at the infant than at the adult stage.

In many instances of mesioclusion, especially when hereditary factors are predominant, preventive and curative surgical methods are contraindicated, and orthodontic treatment is preferred.

Preventive surgical therapy, however, is indicated when the anomaly is caused by anatomic alterations or when several teeth groups are in malposition. Therapy consists of extraction of involved deciduous and permanent teeth (in abnormal or anomalous position); complete removal of implicated dental germs, and tooth remains; plastic surgery in instances of cleft lip, cleft palate and macrostomia; adenoidectomy; tonsillectomy; and a cuneiform excision of the tongue in macroglossia.

Curative surgical therapy is indicated in instances of true and "imitating" prognathism, in unilateral and bilateral protraction, and in simultaneously occurring effects of different forms of malocclusions. This therapy consists of plastic surgery in facial disfiguration; extraction of involved incisors, cuspids, carious and supernumerary teeth; in surgical correction of interdental diastemas; in simple ostectomy such as resection of the vestibular wall after extraction of misplaced anterior teeth (Davenport's method); in intracavitary alveolectomy; retrodental osteotomy (Bichlmayer); cuneiform transversal resection of the palate (Cohn-Stock); horizontal

vestibular osteotomy (Kostecka and Kretz); posterior palate osteotomy (Cohn-Stock's method, modified by Wassmund), and a partial immobilization of the upper jaw (Wassmund's method).

In instances of microgenesis, macrogenesy and retrognathia, osteotomy according to Wassmund's, von Eiselsberg's, Dufourmentel's, Limberg's or Trauner's methods is recommended.

▼ Fractures

Treatment of traumatic lesions of the temporomandibular joint (Terapêutica das lesões traumáticas da articulação temporomandibular)

Baptista Fernandes. *J. estomat.* 2:5-8 April-May 1955

Fractures of the temporomandibular joint occupy an important place among the various traumatic conditions affecting this complex part of the so-called masticatory mechanism, which includes not only the teeth and their supporting tissues, but also the upper and lower jaws, the muscles, the temporomandibular articulations, the ligaments, and even the salivary glands. Any disturbance of the functional balance between these various structures leads to trauma of the joint.

Intrinsic traumas are caused in large measure by defects in dental articulation, and they can be corrected only by careful orthodontic readjustment and the use of prostheses as needed. Extrinsic traumas differ in severity according to the nature and force of the injury by which they are produced; open reduction of the dislocated fragment followed by fixation with pins or wires is successful in some cases of fracture, but in others, condylectomy is required.

In children with fractures of the condyle, the younger the patient the more serious the prognosis. Complications, which are always hard to avoid, are related to two factors, especially in children: (1) the early and invariably hyperplastic cicatricial reaction of the injured condyle, which tends to produce ankylosis with extensive fusion between the mandible and the base of the skull, and (2) serious disturbances in the growth of the mandible (shortening and atrophy) resulting from the injury to its most important growth centers, which are localized in the condyle. Treatment should always be aimed, therefore, both at preventing the development of ankylosis and at limiting the intervention on the condyle as much as possible in order to avoid aggravating the functional deficit of the condylar growth center, which has already been compromised by the trauma of the fracture.

Conservative treatment of mandibular fractures

Harold Boxer and Edmund H. Zabriskie. *New York J.Den.* 25:337-339 Nov. 1955

Methods of diagnosis and treatment of mandibular fractures at the Metropolitan Hospital, New York City, are described. Clinical diagnosis is based on the following symptoms and signs: pain, tenderness, swelling, discoloration, drooling, abnormal mobility, crepitus, faulty occlusion and a tear in the skin or mucous membrane. The most important sign is a disturbance of the occlusion. Final confirmation of fracture depends on accurate roentgenograms. The majority of mandibular fractures are treated by conservative methods. Simple intraoral appliances are used to obtain reduction, fixation and union of the fractured parts to restore occlusion. Radical methods of treatment are reserved for those fractures in which an edentulous fragment cannot be controlled, the extent of displacement prevents union, or when there is considerable loss of bone so that bone grafts, wiring or plating are required.

Where enough teeth are present in the maxilla and both mandibular fragments to approximate the natural occlusion, Ivy loops or any of the modifications with no. 23 stainless steel wire are used. In intermaxillary wiring the fracture should never be crossed horizontally by the wiring, for this ties the fragments together horizontally and prevents vertical restoration of the natural occlusion. Most intermaxillary wirings are done in the clinic, in an approximation of office conditions, with adequate premedication. The use of

acrylic splints for intermaxillary immobilization has been discontinued. Circumferential wiring is excellent for immobilizing the fractured edentulous mandible where both fragments can be covered by the saddle of either the patient's denture or by an acrylic baseplate prepared from an impression.

▼ Transplantation

Successful replantation

(Erfolge bei der Replantation)

H. Tracksdorf. *Zahnärztl. Reform* 56:276 July 1955

The success in replantation, the reinsertion of a tooth into the socket from which it had been removed, depends on the quantity of the remaining periodontal tissues and their ability to regenerate. Failures in replantation, as often reported in dental literature, probably are based on the assumption of many dentists that the replantation can be regarded as the ultimate refuge in the retention of teeth which otherwise would be lost. In most instances, it is a matter of so-called "late replantations"; that is, the periodontium possesses very little vitality or regenerative ability because of injuries caused by previous root treatments, drugs and other chemicals used during these treatments, and damage caused by inflammation or disease. In those instances, replantations were executed with nonvital teeth or in instances in which a large quantity of periodontal tissue had been lost. No measure, including replantation, can preserve these teeth.

The first permanent molar is the key to occlusion. Its mortality in the average youth of today is appalling and is responsible for many subsequent dental destructions. Research on facial growth and development provides evidence that the position of the first permanent molar in forming the dental arch is of primary significance. The loss of this tooth may cause progressive malocclusion in advanced periodontal disease, dental caries of the neighboring teeth and deformity of the complete dentition. In most of these instances, an autogenous replantation is indicated. The patients selected for this procedure should be carefully screened to make certain that their oral condition will make the contemplated replantation feasible. Persons especially susceptible to dental caries, with several teeth already missing, with diseased gingiva or focal infections and those in poor health are unpromising subjects for a successful replantation.

When the patients are young, the reinsertion of vital second or third molars into the socket from which the tooth had been removed, can be performed satisfactorily. This method conforms as nearly as possible to the natural process of development.

When the patients are older than ten years, replantation is contraindicated, and the spaces should be filled with prosthetic substitutions or by orthodontic treatment.

Further studies and investigations should be made not only in regard to proper replantation but also into the question whether selected teeth removed during early root development should be salvaged in a "tooth bank" for purposes of having enough vital teeth on hand for replantation.

▼ Anesthesia and analgesia

Toxic reactions from local anesthetics

Harold N. Wright. *Minneap. Dist. D.J.* 39:57-59 Sept. 1955

Solutions of local anesthetics are widely used to produce various forms of local anesthesia both in dentistry and in general surgery. Their use is always attended by the possibility of the development of toxic reactions. The average mortality rate for all operations under local anesthesia is about 1:5,000. The mortality rate in dental anesthesia is much less than for "all operations under local anesthesia." A table of safe doses of local anesthetics is presented.

Major factors in preventing local anesthetic accidents include taking an adequate history of the patient; avoiding errors in concentrations and identity of solutions (the most frequent ac-

cident is confusion of procaine and cocaine); avoiding concentrations greater than necessary for the occasion, and avoiding total dosage exceeding the indicated safe limits; avoiding accidental intravenous injection, especially in highly vascular regions, and routine administration of a short-acting barbiturate one to two hours before administration of the local anesthetic.

Toxic reactions in normal persons are almost invariably due to overdose. The reactions involve, principally, stimulation or depression centrally of the cerebral cortex, subcortical ganglia and medulla, and peripherally of the cardiovascular and respiratory systems. Symptoms usually start with anxiety, laughter, excessive talking, mental confusion, hysteria, motor excitement, rapid pulse, palpitation and irregular respiration. Patients may complain of fullness in the head, or dry throat; nausea and vomiting sometimes occur. More serious poisoning brings delirium, muscular tremors, tonic and clonic convulsions, elevated blood pressure, rapid heart rate and rapid shallow respiration. Death may take place by either respiratory or cardiovascular failure. Almost all such deaths occur within a few minutes. Toxic reactions in patients showing abnormal responses occur from the use of usual therapeutic, or even very small, doses, and are due to allergy, hypersensitivity or idiosyncrasy. Such reactions occur only once in several hundred thousand anesthetic procedures.

Use of steroid anesthesia in surgery

Frank J. Murphy, Neri P. Guadagni and Francis DeBon. *J.A.M.A.* 158:1412-1414 Aug. 20, 1955

Viadril (21-hydroxypregnanedione sodium succinate) was given a clinical trial as a basal anesthetic for surgery at the University of California School of Medicine. The compound is a promising, new, water-soluble steroid. It is a white, crystalline substance that is soluble in water and has an alkaline reaction, the pH being 8.5 to 9.8. The compound was used in 125 patients for basal anesthesia in a variety of surgical procedures and in three patients for sedation during regional anesthesia. It is a true anesthetic agent, as evidenced by its ability to control pain, obtund reflexes, produce relaxation, and produce sleep, all without depression of vital functions. It produces an analgesic state far greater than that produced by the barbiturates. It potentiates the effect of opiates in both analgesic effect and respiratory depression. Technics of administration are described.

The most satisfactory results have been obtained when administering 21-hydroxypregnanedione sodium succinate together with nitrous oxide (75 per cent) and oxygen (25 per cent). In many instances it has been found necessary or advantageous to add meperidine hydrochloride, other agents, or relaxants. The latter drugs are all effective in dosages considerably smaller than would have been employed had the patient been receiving thiopental sodium-nitrous oxide-oxygen. The compound offers definite useful possibilities in anesthesiology and merits further clinical trial. Its administration is reasonably safe, and it has a high therapeutic index.

▼ Roentgenology

Speech without larynx: roentgenocinematographic analysis of pseudospeech (Kehlkopflose Sprache: Röntgenkinematographische Analyse der Pseudosprache)

G. Möckel and B. Schlosshauer. *Deut. med. Wochenschr.* 80:1244-1246 Sept. 2, 1955

Dentistry recently entered the field of speech therapy. Patients with malocclusions are more inclined to have speech defects than patients with normal occlusions. Why do some persons with severe malocclusions have perfect speech, and why do others with normal occlusion have speech defects? Does the speech defect cause malocclusion? These are questions that as yet no one has answered satisfactorily.

There are instances, however, where normal speech ability does not exist. After laryngectomy, patients are unable to produce the combination of intelligible sounds necessary for speech and have obviously lost the capability of speech. In

these instances, another method of speech therapy must be applied. The patient has to learn to form sounds in the esophagus instead of in the larynx.

This pseudospeech was analyzed by roentgenocinematography. Sixteen laryngectomized patients were examined, and one normal person served as control. Pseudospeech has been made possible by the development of a pseudoglottis at the upper end of the esophagus. Patients who had by this method achieved articulate pseudospeech, capable of inflection, had developed a narrow and highly mobile pseudoglottis, the esophagus showing not only contractions over its entire length but also antiperistaltic ripples which permitted the slow release of the esophagal air during articulation. Those patients whose speech still remained indistinct had a pseudoglottis that was rather stumpy and immobile. In a few instances even a second pseudoglottis was developed; these patients were able to speak with optimal distinctness and articulation.

Ionization chambers for radiation data during dental x-ray exposure

Donald C. Hudson and John W. Kumpula. *U.S.Armed Forces Med.J.* 6:1131-1135 Aug. 1955

A project in the U.S. Air Force Dental Service laboratory is concerned with the development of a device for making extraoral, full-mouth, panoramic dental roentgenograms. To determine levels of radiation produced with the panoramic device at various points in and about the head, a wax phantom head was constructed. Ten ionization chambers were placed within the head, to measure radiation levels during a full-mouth dental roentgenographic examination by a panoramic method and by a conventional 14-film intraoral technic.

In each full-mouth exposure, the conditions that would exist during actual clinical practice were observed. One series of 14 exposures made by conventional means was sufficient to produce radiation levels at all measuring points falling within the range of the ionization chambers. When using the panoramic method, it was necessary to repeat the exposure ten times in order to obtain levels of radiation that could be measured reliably by use of the same chambers. With the panoramic method, the total skin surface exposed to radiation at any point in the exposure cycle was less than one square inch. During exposure by conventional methods, about 12 square inches of skin area were irradiated during each individual film exposure. The highest level of ionizing radiation with the panoramic technic existed in the cervical lymphatic region of the neck and amounted to 0.42 r. The highest levels of radiation when using conventional intraoral roentgenographic technic existed at the "skin" of the cheek and in the region of the thyroid gland, where 23 and 27 r, respectively, were recorded.

Intraoral roentgenology

(Roentgenologia intraoral)

P. Aguilar Ortiz. *Rev.As. odont.Argentina* 43:219-224 June 1955

A mechanical device for intraoral roentgenography, based on the principle of the right angle, is presented and graphically described. The device consists of (1) a film holder, (2) a "b" scale, (3) an extensible bar marked in millimeters and (4) an extra tray and indicators for stereoscopic roentgenograms. The film holder stands in front of the "b" scale, which is graduated in degrees from 0 to 15 and also shows minutes and seconds. The film holder is moved 8 degrees 2 minutes 40 seconds in the "b" scale, first to the right and then to the left in relation to the tube of the x-ray apparatus, before exposure of each of the films for taking roentgenographic films in the vertical and the horizontal positions. The bar marked in millimeters moves back and forth and settles at 23 cm. for fixed constant anode-film distance.

The parts of the device that are placed in the mouth can be sterilized. The device is small in size and can be used with any type of x-ray apparatus employed in dentistry. Distortion of x-rays and overlapping of images in intraoral roentgenograms do not occur. Stereoscopic roentgenograms can be taken with the device. The technic is described in detail. For stereoscopic pictures, a dental impression of the teeth is taken in a modeling substance placed in the tray which is introduced through an opening of the film

holder already in position at 8 degrees 2 minutes 40 seconds to the right; the tray is then removed and the exposure made. In the second picture the film holder provided with the film, already in position at 8 degrees 2 minutes 40 seconds to the left, and the tray are brought in contact with the cutting edges of the teeth, the tray is removed and the exposure made. Stereoscopic films corresponding to the right and left sides of the tube of x-ray apparatus are marked for purposes of identification by means of indicators placed in the angles of the films. The evaluation of stereoscopic dimensions can be made only in apparatus in which the roentgen rays are projected in the same direction as that in which the original picture was taken. All the measurements and angles of the stereoscopic reproduction are identical with those shown by the object facing the x-ray tube when the picture was originally made. They can be measured geometrically by calibrated stereoscopes.

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Pathology

Importance of cementum in bone reconstruction after radical apical operation (Die Bedeutung des Zahnwurzelzementes bei der Knochenregeneration nach apikaler Radikaloperation)

K. Lehnert. *Stoma* 8:67-77 May-June 1955

The value of radical operations, intended to extirpate the disease completely, still is questioned by many conservative authors. Recently published reports, however, describe from 80 to 95 per cent favorable results, achieved by radical apical surgery. This can now be considered as a reliable surgical method, especially in the treatment of focal infections.

The healthy condition of the cementum is important for a complete recovery after apical periodontitis. The prerequisite for a full osseous reconstruction is the ability of the cementum to reproduce the destroyed or eliminated tissues. This reproductive ability of the cementum must be maintained after radical apical operations. It will then be possible to treat also multirooted teeth, even if large parts of the roots are exposed, without the tooth losing stability or support.

After an observation of about three years, no resorption could be determined by roentgenographic examination; the ability of the cementum to reconstruct osseous tissues was restored.

Salivary gland tumors

M. R. Ewing. *Med.Press* 234:112-115 Aug. 3, 1955

Mixed tumors of the parotid gland are encountered at all ages. Women are affected rather more often than men. The etiology of these tumors is unknown. The most striking feature of a mixed parotid tumor is its very slow growth and the absence of pain. Mixed tumors most often grow from the lower half of the lower pole of the gland which projects downward into the neck, below the angle of the mandible. Typically the patient will have a swelling over the angle of the jaw, immediately below and in front of the ear lobe. The tumor is typically firm and may be hard. It is rounded and often lobulated. Even the largest tumor is unaccompanied by facial palsy.

An adamantinoma is an uncommon tumor which is seen most often in the lower jaw close to the angle. A mixed parotid tumor seldom kills a patient; only the complexity of the anatomy of the parotid gland and its relation to the facial nerves makes complete removal difficult. Attempts at surgical removal are sometimes followed by recurrence deep in the operation scar. The chance is extremely remote that a simple tumor will spontaneously undergo malignant degeneration. Some surgeons claim good results in the avoidance of local recurrence by introducing radium needles into the cavity at the end of the operation.

Cancer, an uncommon type of growth in the salivary glands, has distinctive clinical features: a short history, a hard, irregular, painful tumor, and a facial palsy.

Periodontics and endodontics

▼

Periodontics

Parodontopathies and periodontal status (Parodontopathien–parodontal Status)

G. Focke. *Deut.zahnärztl.Kal.* 14:142-161, 1955

The periodontium consists of the investing and supporting tissues surrounding the teeth, specifically the periodontal membrane, the gingiva and the alveolar bone. Physiologically, it is a homogeneous functional system. It intercepts normal forces that influence the teeth, the periodontal fibers, the vascular canals and the lymph exudation, and dispatches these forces to the alveolar bone. Genetically, it is a matured sac, a unit of mesodermal origin, that forms and supports the cementum which is not connected organically with the dentin but is attached to it.

The term "parodontopathy" includes all pathologic alterations of the periodontium and primary morbid processes of periodontal tissues, especially different forms of diseases such as gingivitis, periodontitis, and periodontosis.

From the results of microscopic, etiologic and histologic examinations, parodontopathies can be classified as diseases with little, moderate and serious infiltration into the subepithelial connective tissue. The frequent symptom of missing and loose teeth (deciduous and permanent) may cause disarticulation. The fewer the number of remaining teeth, the more difficult is the prognosis. Upper and lower jaws should be evaluated differently. As a diagnostic sign, diastemas, caused by the migration of upper and lower incisors, will be observed.

Roentgenographically, the destruction of portions of the alveolar bone follows a pattern. The loss of osseous tissue usually extends in an arc from the mesial surface of the second molar to the distal surface of the second bicuspid. In several regions, a thinning of the alveolar crest will be observed. The epithelium presents a distinct keratin stratum. The epithelial cells are compact without cellular profileration or edema. The corium consists of heavy strands of collagen fibers, fibroblasts, lymph and blood vessels; and a minimal number of lymphocytes and plasma cells can be observed. Opposite the gingival sulcus, these cells are more numerous, and in a few instances, scattered polymorphonuclear leukocytes are discernible.

Periodontosis occurs most frequently in women during adolescence and early maturity. In the primary stage, the clinical appearance of the gingiva seems normal. The migration of upper and lower incisors, with resultant diastema, is often the first phenomenon. During the course of this disease, the upper incisors become elongated and protrude labially, exposing the cementum. Because a large portion of the osseous tissue is destroyed, there will be food impaction, traumatic occlusion, cal-

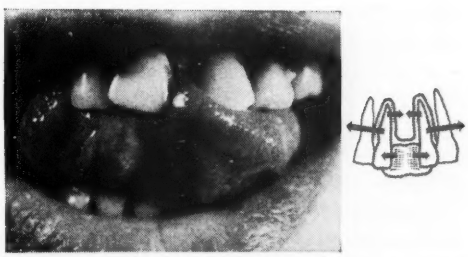

Figure 1 Enlargement of space through tongue pressure

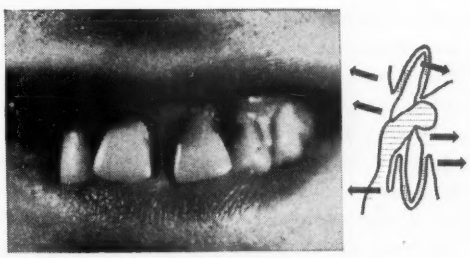

Figure 2 Effect of lip-biting

culus, and an accumulation of microorganisms, causing severe inflammation and additional loss of supporting tissue.

Therapy can consist only in differential localized treatment, with immediate stabilization of migrating teeth. Whether the epithelial attachment can become reattached to the tooth is still a question frequently discussed in dental literature. It is unlikely that the epithelium is able to reattach itself to the enamel, but since the epithelial attachment proliferates to the natural position, it seems likely that new epithelium, covering and repairing gingival defects, may attach itself to the cementum.

Certainly, the ability of all tissues to return to their original position after trauma is limited. This was revealed in instances of all parodontopathies in which intraoral irritants, trauma and microorganisms were present. Since these possibilities should be anticipated, the extent of regeneration in each instance is a challenge to the dentist.

Some orthodontic-therapeutic aspects of the treatment of periodontal diseases

(Några Ortodontisk-Terapeutiska Synpunkter På Behandling Av Parodontopatier Och Tandvandringsbrett)

Ragnar Granerus. *Sveriges tandlak. forb. tidn.* 47:455-472 Aug. 15, 1955

Treatment of periodontal diseases involves, besides surgical therapy, a reconstruction of the normal function of the dental arches. This reconstruction may vary from grinding the teeth into balanced occlusion to the construction of various types of prosthetic appliances. Primary or secondary malocclusions or combinations of the two should be considered in the diagnosis and the reconstruction of normal function may involve orthodontic procedures. Orthodontic treatment for adults should be further developed in close coordination with prosthetic and periodontal treatments.

Primary malocclusions often cause periodontal disease which, in turn, may lead to various secondary malocclusions, thus creating a vicious circle. Typical secondary malocclusions discussed are as follows: elongation of molars and bicuspids by loss of antagonists, elongation of front teeth by unbalanced occlusion in the molar area, and tooth movement due to loss of contact, lowering of the bite, bruxism, or lip or chewing habits.

Principles of orthodontic treatment of periodontal cases are discussed, including histologic aspects such as bone response, technics for moving the teeth, magnitude of forces and age limits for various treatments.

Retention and fixation should be given special attention. Removable plates of chrome alloy with adjustable labial arch are recommended as an alternative to fixation by fixed bridgework.—*G. Ryge*

Gynecology and dentistry

(Gynäkologie und Zahnheilkunde)

Hans Baatz. *Zahnärztl.Rundschau* 56:358 Sept. 1955

The field of dentistry sometimes borders that of gynecology, especially in instances of gingivitis, periodontosis, dental caries and focal infections, occurring during pregnancy. Hormonal dysfunction and vitamin or mineral deficiency are often observable during puberty. Gingivitis marginalis suppurativa usually appears in the fourth month of pregnancy.

The therapy recommended consists of daily massages of the gums with lactoflavin and the administration of vitamin C. During the climacterium, desquamative gingivitis also occurs, characterized by follicular hormone secretion. The accepted treatment is an equalization of the hormone or vitamin deficiency, local ultraviolet radiation (quartz lamp), and changes in the nutrition. The treatment of two forms of paradentosis, the type caused by ovariogenic insufficiency, frequently occurring in patients from 20 to 30 years old, and the type occurring during the climacterium, demands cooperation between dentist and gynecologist. Therapy should be directed toward normalization of the ovariogenic function. During the menopause, hormonal deficiency often is accompanied by severe psychical disturbances. Additional doses of hormones and sedatives, and possibly psychotherapy, will improve the condition.

During pregnancy, dentist and gynecologist must be apprehensive of the appearance of dental

caries, not only in the interest of the pregnant mother but also in regard to the unborn child. The maternal blood-fluorine level should be increased by fluorine doses which also will favorably affect the development of the fetal tooth system. The prophylaxis consists of the control of the mineral metabolism by increased vital and natural nutrition such as fruits, vegetables and milk products. In instances of severe deficiency of calcium and vitamin D, doses of phosphoric and citric acids, and calcium should be administered.

The treatment of caries during pregnancy should begin as early as possible. The high fetal demand of calcareous material, especially in the last months of pregnancy, may lead to a more unfavorable prognosis for caries than in patients who are not pregnant. Adverse effects following or caused by caries also occur during lactation.

Therapy of dental focal infection may start between the fourth and sixth months of pregnancy. The advisability of oral surgical intervention depends on the general health of the pregnant patient; cooperation between dentist and gynecologist is essential in these instances. Focal infections often are causative factors in gynecologic diseases such as oophoritis, salpingitis, parametritis, perimetritis, endometritis and colpitis. In instances where focal infections are suspected, a roentgenographic examination of the entire system will be necessary. If the dental focal infection is not treated successfully, the gynecologic therapy may be endangered.

Signs of periodontal disease. Practical conceptions in interpretation (Signos de la Enfermedad Periodoncial. Conceptos Practicos en la Interpretacion)

José S. Mazzoni. *Rev. lat.-amer. periodont.* 4:29-38 Jan.-June 1955

From clinical observations and from experiments it was found that certain objective signs that occur in the gingival and periodontal tissues indicate an existing or a former general systemic disease as the cause of the periodontal disease. The signs are gingival changes either of an acute inflammatory type (reactional) or of a late post-inflammatory type (cicatricial). The changes involving the supporting tissues always point to a general systemic disease as the cause of the periodontal disease. Those involving the gingival tissues are complicated by the lesions produced by pocket formation. When the signs are located in one region only, they indicate a general disease as the cause.

In the patients observed, the changes took place in the marginal gingiva only, except in one instance in which the interdental papillae only were involved. In all instances the signs were closely related to the evolution of the general disease. McCall festoons and Stillman's fissures, which are considered in the literature as caused by local factors, are in reality caused by general (cicatricial) factors. Observations reported include the following: (1) inflammatory reaction of the marginal gingiva caused by digestive disorders, improvement of the general disease, subsidence of inflammation and constitution of McCall festoons in one instance and of Stillman's fissures in another instance; (2) aggravation of McCall festoons coinciding with periodical reactivations of pathologic pocket; (3) discolored festoons from presence of acute inflammatory reaction caused by general disease; (4) McCall festoons and Stillman's fissures in a dog after recuperation from acute gingivitis and stomatitis, and (5) papillitis caused by malnutrition. Lesions located in several parts of the gingival tissues were observed in one patient. They developed after the occurrence of repeated inflammatory reactions caused by general disease. The data obtained through interpretation of the signs in the gingival tissues are not sufficiently specific to show the actual nature of the general systemic disease. They do show, however, the general origin of the periodontal diseases, and the need of treatment for the general systemic disease.

The etiology of periodontitis (Über die Ätiologie der Alveolarpyorrhöe)

L. Saenz de la Caldaza. *Österr. Ztschr. Stomat.* 52:382 July 1955

Imbert's and the author's examination of several severe cases of periodontitis proved that the following symptoms (simultaneously or alternately) were present: premature calcareous degeneration and diminution of the pulp, increased density of

dentin, changes of the dentinal fibrils of the odontoblasts to granular cords with obliteration of pulp canals, shrinking of the odontoblasts and their nuclei, calcareous and adipose degeneration of pulp tissues, and finally sclerosis and petrification of dentin. In the cementum-dentin region, a gradual destruction by a phagocytic process was observed, advancing toward the root apexes with coincidental changes of the alveolar bone. The injured periodontium is easily infected. The teeth become "foreign bodies" and will be exfoliated.

This process begins with the degeneration of the odontoblasts and progresses to the external strata. For treatment of this condition, many authors suggest estrogenic hormones, either by local application or by injection. This method, however, does not always achieve favorable results. Surgical removal of involved tissues may result in temporary improvement, but subsequently many symptoms reappear. Treatment with antibiotics has been unsuccessfully tried, although the danger of a collateral infection was thereby reduced.

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Endodontics

Pulp treatment in deciduous teeth: Postoperative survey of pulpotomy and pulp capping.
(Pulpabehandling av mjölktänder)

Carin Bergh and Kjell Martensson.
Odont. Revy 6:135-162 June 1955.

The results of pulp treatment of 1,439 teeth in 899 children from three to eight years of age are described. The treatments were carried out in the Department of Children's Dentistry, State Dental School, Malmö, Sweden, from September 1948 to December 1950. Most of them were done by dental students under close supervision.

The necessity of careful selection of patients for pulp treatment and the difficulty in obtaining a correct diagnosis, particularly in children, are stressed. Pulp treatment was undertaken only when (1) roentgenographic records showed normal conditions without periapical or interradicular changes; (2) the pulp was sensitive and was of light blood color. Pulp capping was carried out only when the exposed pulp had not been contaminated by saliva, and when only a small exposure without active bleeding was evident.

One hundred and seventy-six pulp cappings were done using zinc oxide and eugenol, Calxyl and calcium hydroxide paste. One thousand, one hundred and one vital amputations were carried out in instances where there were larger exposures and minimal bleeding. Contamination by saliva was not considered a contraindication for this treatment. The pastes used were as follows: xeroform paste, xeroform paste plus penicillin plus sulfathiazole, Calxyl, and calcium hydroxide paste. One hundred and sixty-two amputations of nonvital pulp were carried out in instances when the local anesthesia was not effective, or was not deemed safe for the child, and in instances in which a tooth was considered very important for the occlusion. Xeroform paste was used for all such amputations.

Good results, as defined by the absence of symptoms or roentgenological evidence of a pathologic condition in the tooth and its surrounding structures, were obtained in 80 per cent of the treatments, irrespective of the method or the pastes used.

The age and sex of the patients and preoperative treatment with Howe's solutions appeared to have no effect on the results.

Successful treatments occurred at a 15 per cent higher rate in the maxilla than in the mandible.

Histological examinations were carried out on a small number of teeth. A longer control period of from one and one-half to two years is recommended.—*G. Ryge*

Prosthetic dentistry

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Complete dentures

Immediate dentures: alveolar ridge trauma from socketed anteriors

A. P. Gimson, *Brit.D.J.* 98:387-391 June 7, 1955

An immediate denture technic frequently used is one in which the posterior teeth are extracted six to eight weeks prior to the commencement of the denture construction. This period allowed for healing produces a foundation which is reasonably smooth and free from sharp bony processes likely to cause soreness under a denture. After this healing period, partial dentures are constructed which are worn for one to two weeks so that the patient may become accustomed to the new conditions. The dentures are then completed by the addition of the anterior teeth to the partial dentures as immediate replacements. In adding the anterior teeth to the partial upper denture, the teeth are socketed so that the artificial teeth have the appearance of growing from the gingiva. This appearance is maintained during the first weeks of resorption since more and more of the "root" is gradually exposed, until after a period of about three months the teeth rest against the tissue and appear to have a gingival fit.

The process can be seen in Figure 1, depicting a socketed immediate upper denture; in the top drawing, the dotted line shows the approximate position of the aveolar process three months after extraction. The unshaded tooth area indicates the shape of the "root" and degree of penetration into the socket when the denture is first fitted. The shaded portion shows how a too deeply socketed tooth may cause ultimate ridge damage.

The socketed denture requires careful attention to produce a satisfactory result. If the artificial roots are carried too far into the tooth sockets with little or no follow-up treatment, considerable damage may be caused to the anterior region of the ridge. This is because the roots occupy regions in their respective sockets which otherwise might have been filled with granulation tissue and eventually new bone.

When preparing the upper model for immediate replacements, the following method is adopted: The gingival margins of the anterior teeth are outlined on the model with lead pencil both labially and lingually, and the long axis of each tooth is also indicated by a pencil line drawn from the center of the incisal edge to a point in the sulcus relative to the median line of the root. This latter line acts as a guide for the correct angulation of the artificial tooth replacing the plaster tooth when removed from the model. The

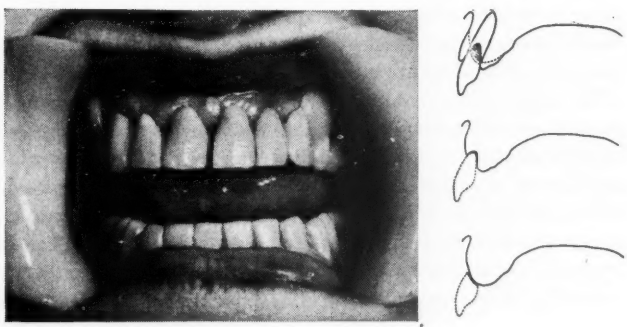

Figure 1 Left: Gingival fit of upper immediate denture three months after insertion. Right: Socketed immediate upper denture. Top: Dotted line shows the approximate position of the alveolar process three months after extraction. Center: A tooth socketed too deeply may cause ridge damage. Below: Three months after extraction the teeth appear to have a gingival fit

first plaster tooth to be removed is carefully cut off the model with a fretsaw.

A socket is prepared in the model, and cut to a depth of 3 to 5 mm. in the labial region, sloping upward and backward from the bottom toward the lingual gingival margin and finished about 1 to 2 mm. below it. In instances in which the pockets are 3 to 4 mm. deep, it can be anticipated that the immediate collapse of the gingival margins after the extraction of the teeth will be considerable; therefore, the socket preparation in the model should extend to the full 5 mm. depth in the labial aspect.

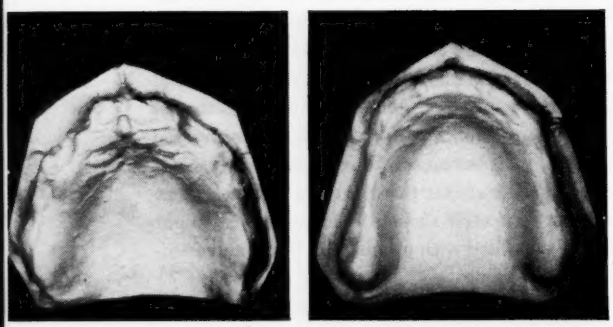

Figure 2 Left: Deep cavitation reaching almost to the rugae. This results from an immediate denture with too deeply socketed "roots" and no follow-up treatment. Right: Well-formed regular alveolar ridges that are the result of having paid careful attention to the depth and contour of the socketed part of the anterior teeth

The artificial tooth is ground and fitted to rest against the labial wall of the socket, and the remainder of the cavity is filled with wax. Each tooth in turn is treated in a similar manner until all have been replaced and are ready to be waxed to the partial denture forming part of the working model, or waxed to the trial partial denture if the finished denture stage is omitted.

The denture is inserted, and the patient instructed not to remove it, but to return the following day. On this occasion the denture is removed and cleaned, the mouth and sockets cleaned, the denture reinserted, and a check made of the extent to which the roots penetrate the sockets. If necessary, the denture is removed and the roots reduced so that there is approximately 3 mm. entering the socket. The lingual aspect of the root is hollowed out to form a concave surface, the lingual edge forming a step of about 1 mm. with the fitting surface of the denture. The next examination should take place four to seven days later when further trimming is carried out if the roots appear to be causing too great a cavitation.

A further inspection should be made two weeks later and then at monthly intervals with adjustments where necessary, until at the end of a three to four month period the careful root trimming should have produced a gingival fit appearance and a smooth, well-formed ridge. At this stage it is often advisable to reline the upper denture. It is an advantage to add a labial flange to the denture to increase retention and replace the lost lip support caused by alveolar resorption.

New dentures are usually required six to 12 months after the insertion of the immediate dentures, to provide a better arrangement of tooth occlusion and to correct for closure of the excess vertical dimension caused by alveolar resorption.

Physical basis for the selection of colors in dentistry (Physikalische Grundlagen für die Farbenwahl bei zahnärztlichen Arbeiten)

V. K. Jlg. *Deut. Zahnärzte Kal.* 14:74-84 1955

In no other profession is the correct selection of colors as important as it is in dentistry. The esthetic appearance of the wearer of artificial teeth depends on the dentist's ability and taste in finding the matching coloration.

The dental profession has felt for a long time the need for a reliable method of equalizing correctly the color of plastic teeth with that of natural teeth. Incandescent and fluorescent light have peculiarities which can lead easily to color disharmony. In industry, the distances from which objects are viewed, the angles at which they are held, and the background against which they are exhibited are today standardized. Dentistry could benefit from the color standardizing methods which are being developed by business and industry. The terminology and basic facts about color selection are easy to obtain. Color has three dimensions: hue, value and chroma. It is of importance to the dentist concerned with match-

ing artificial and natural teeth to understand how the different colors vary in accordance with these properties. That which is called "light" is a mixture of various wavelengths which the eyes perceive at a distance from 400 to 700 millimicrons as color. When none of these wavelengths is predominant, the eye perceives the accumulation of the waves as white light. The spectrum of normal daylight consists of nearly equal quantities of red, yellow, green, blue and purple. From this spectrum, a colored body absorbs these colors, even those which it does not possess, and appears in the color it reflects. The body therefore can appear only in that color which it receives from the specific light spectrum.

Since standard artificial teeth are supplied in colors ranging from yellow to brown, from yellow to grey, and from white to pink, the dentist must possess adequate color discrimination to solve the problem efficiently. The time is not far distant when the manufacturers of artificial teeth will match their products with natural teeth by applying new, scientific, color-selecting instruments. Without such modern scientific technics, there can be no way to match correctly artificial and natural teeth so that they correspond perfectly in daylight and artificial light. Even daylight has many variations which are determined by different angles of incidence, and can be classified as light in the morning, noon, afternoon, and evening, and as indirect light in the shadow, and when the sky is clouded. The fluctuation of artificial light is far greater. By matching plastic and natural teeth in artificial light, the result depends on the dentist's ability to perceive the degree of similarity and dissimilarity under the different sources of light. The specific spectrum of artificial light contains a higher percentage of the red and yellow variations, and a scarcity of blue variations.

The best time for color selection of plastic teeth is between 10 A.M. and 3 P.M. The most adequate exposure to light is at daylight when the sky is clouded. The perfect matching of colors by artificial light is impossible. When the dentist has to select the colors by either morning or afternoon light, the predominance of red and yellow color components must be taken into consideration. The selection of colors will be easier when the walls of the dentist's room are painted in neutral colors. If the patient uses too much lipstick, the surplus of red must be removed before the matching of artificial and natural teeth can be undertaken.

The transparence, resplendence, opacity, opalescence and luminescence (fluorescence and phosphorescence) of light and both artificial and natural teeth must be considered and evaluated.

▼ Partial dentures

Some fundamentals of partial denture design to conserve the supporting structures

D. S. Moore. *J. Ontario D. A.* 32:238-239 Oct. 1955

A properly designed partial denture aids in removing the causes of periodontal disease and in keeping the mouth healthy. In the construction of a partial denture, certain physiologic fundamentals should be observed:

1. The force exerted by the muscles of mastication is the same whether all the teeth are present or only half are present.

2. A replacement must not only fill in a space to provide better mastication but must take the load off the remaining teeth.

3. A wide distribution of the forces is necessary to take as much of the load as possible from the other teeth. The partial denture should cover as much of the mucosa as is feasible but should be kept away from the lingual aspects of the teeth to prevent strangulation and tissue irritation.

Factors to be considered in designing partial dentures include the following: restoring the correct occlusal plane by grinding off the cusps of tilted or over-erupted teeth; incorporating in the design knowledge gained from the examination; selective grinding to overcome cuspal interference or lack of balance in centric or eccentric positions; offsetting the direction of the forces placed on the teeth and ridges; decreasing the size of the food table but maintaining the escape grooves and cusps; designing so that the force is

delivered to as many teeth as possible, the direction of the force being parallel to the long axis; arranging occlusal rests close to the central axis and preparing the teeth for the rests before the impression is taken, and designing the clasps to prevent tilting of the abutment teeth. When the occlusal plane is flat, the teeth should also be cuspless, but cuspless teeth should not be used to replace molars when the bicuspids are not well worn and have steep inclines.

Healthy teeth that have tilted, rotated or drifted sometimes must be extracted. When teeth that have been out of occlusion (and hence out of function) are brought into function again, this should be done gradually, to condition the supporting tissues to withstand the stresses.

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Miscellaneous

Psychosomatic aspects of prosthodontics

Herbert T. Kelly. *J.Pros.Den.* 5:609-622 Sept. 1955

The literature and principles of psychosomatic dentistry are reviewed. Psychosomatic changes occur in the mouth as frequently as in other parts of the body, but because of the anatomic structure of the tissues in the oral region, pathologic changes more readily become permanent. Some common oral manifestations of disturbed psychosomatic interrelationships are discussed. It is essential that the prosthodontist view the patient as a functioning whole, and recognize that the neurotic dental patient comes to him with more than the desire for oral rehabilitation. The prosthodontist cannot remain content to treat a psychosomatic disturbance merely by asking the patient to answer a few terse questions, to submit to roentgenography and so forth. In instances of psychosomatic oral disturbances, patients should be given the opportunity for preventive psychotherapy in which defects of personality or neurotic conflicts are dealt with, even though these psychic disturbances may not seem directly related to the existing dental disturbances.

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Crown and bridge

Procedure for reconstruction with autopolymerizing resins in the mouth

(Procedimiento de Reconstrucción en Boca con Resinas Autopoloimerizables)

Tomás Martínez Rodríguez. *Rev. españ. estomat.* 3:337-340 July-Aug. 1955

The procedure for the replacement of acrylic resins detached from bridges is carried out in three clinical sessions without removing the bridge from the mouth.

1. The involved region and bridge are cleaned carefully, and an impression of the bridge and another of its counterpart are taken. The models are mounted on an articulator, and a pattern of the lost resins is made with blue wax on the model of the bridge.

2. The rest of the old resin is entirely removed with a bur used at low speed. A bottomless tray is used to take an alginate impression of the models in occlusion. This impression then is washed and placed for a few minutes in a 5 per cent solution of alum. The cavity left in the bridge by the detached resin is cleaned with tepid water, dried with hot air and humidified with a drop of monomer. In the meantime the assistant prepares the resin paste to be used. The paste has the consistency of bread dough. This paste is introduced into the cavity of the bridge in small amounts sufficient to fill the cavity with an excess. As soon as the cavity is filled, the impression (which was taken from the models in occlusion) is placed in the patient's mouth. Compression of the new resin filling takes place automatically under the impression, which is perfectly adapted when the patient closes his mouth firmly and keeps it closed firmly for from five to six minutes. After this, the impression is removed from the mouth and the small excess of resin, if any, is removed with a small stone.

3. The restored piece is then gently polished and finished, without using pressure that may harm it. Other indications for this procedure are for fillings with acrylic resin, especially in reconstruction of the incisal angle and for the restoration of Steele's facings.

The relationship between retention and convergence angle in cemented veneer crowns

K. Dreyer Jorgensen. *Acta odont.Scandinav.* 13:35-40 June 1955.

Galalith cones, 8 mm. high, with a base diameter of 8 mm., and a convergence angle of 5, 10, 15, 20, 25, 35 or 45 degrees, were used to test the retention of brass caps, cemented to the cones by one brand of phosphate cement. The cones and caps were made on a lathe to an accuracy of ± 0.005 mm. The surface was in every instance dull and with no turning marks. Ten cones and three caps were made of each convergence angle.

The cones and caps were provided with bases to allow mounting in the machine for tensile testing.

The relation between retentive forces and the convergence angle was found to be a hyperbola with the formula $(y - a) \cdot x = K$, where y is the retention in Gm. per $mm.^2$, x is the convergence angle and a and K are constants.

The retention is substantially increased by a very slight scratching of the surfaces that are to be cemented.–*G. Ryge*

A biomechanical approach in the teaching of crown and bridge prosthodontics

Carl T. Leander. *Harvard D.Alumni Bul.* 15:7-10 July 1955

Failures in bridgework are due principally to a failure to understand and apply biomechanical principles. The mouth should be considered in its broadest aspects. Restorative dentistry succeeds only insofar as it utilizes structures which apply mechanical principles to counteract a variety of forces exerted on the teeth and their attachments, or to bring such forces within safe limits of tolerance of the oral tissues.

Among the cardinal principles involved in a completely fixed bridge span are the following: (1) the retentive value of the attachments must be reasonably equal, (2) the length of span should be consistent with the periodontal membrane area support of the abutment teeth and (3) the abutment teeth should be immobile in relation to the bone support and to each other.

Factors which affect attachments in the mouth include variations in tooth size, form and position; the excellence of the preparations; the thoroughness with which the attachments are placed, and the extent to which the displacing forces in function have been reduced. The quantity of sound tooth structure available must be considered in evaluating the foundation.

Design of the pontic section can be governed by biomechanical principles. For example, the strength of a beam of rectangular cross section is directly proportional to its width and to the square of its depth; that is, in two beams of the same width (for example, the same buccolingual dimension), the one which has twice the depth will be four times as strong. The amount of bending varies as the cube of the length, so that a fixed bridge with two bicuspid pontics should be made several times stronger than an equivalent bridge with one pontic, other things being equal. A biomechanical approach encourages the student to think effectively and to analyze the reasons for the various operational and technical procedures.

Orthodontics

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Orthodontics

Functional orthodontics and correction of speech defects

(L'orthopédie dento-faciale fonctionnelle et la correction des troubles du language)

Fred Blau, Rennes, France.

Fortschr.Kief.Ges.Chir. 1:122-126, 1955

The ability to express emotions, meanings and thoughts by speech is one of the functions that sets man apart from animal. Speech is a series of communicating signals that originally were grunts, squawks, hisses and snarls, and that developed, parallel to the evolution of man, into several stereotyped systems. More than anything else, the ability to speak created human civilization, culture and the educative process on which all achievements of mankind are based.

Speech is not an inherited function, and persons who have congenital or acquired defects in their speech mechanism need help either through orthodontic therapy or speech correction. Therefore, orthodontics and speech therapy play an important part in dentistry.

Orthodontics usually employs activating (functional) forces to influence the muscular system of the oral cavity, correcting jaws with imperfect development or when the jawbones are in incorrect relation to each other and malposition of the teeth exists. For these purposes, the universally known apparatus, the activator (monoblock), is used as a generator of muscular stimulus. This instrument causes functional irritating actions in the central nervous system, transmitting the irritations to the muscles. The muscles so stimulated then act as forcing agents and influence parts of the skeleton and the jaws. A chain action is produced, and the links, consisting of functional tissues, react to each other.

The lower jaw and its muscles form the first link in the masticatory system. The mouth must be opened to receive nourishment, the lower jaw then moves in a downward direction. The masticatory muscles start to work and all other oral organs are coordinated with this action. The masticatory function and the speech function are so closely connected that a defect of a single link can influence all other organs. To evaluate such defects exactly, cause and result, function and adjustment should not be confused.

When the motor element of speech articulation is defective or injured, the disturbances of speech can be classified as: difficulties in the formation of dental sounds such as D, T and L; of velar sounds such as K, G and Q, and of labial sounds such as B, P, W and V. Many of these disturbances are caused by malfunctions of the tongue. Speech therapy corrects these defects by increasing breath pressure, training breath direction, strengthening muscular coordination of lips and adjoining parts, and intensifying the palatopharyngeal sphincter control.

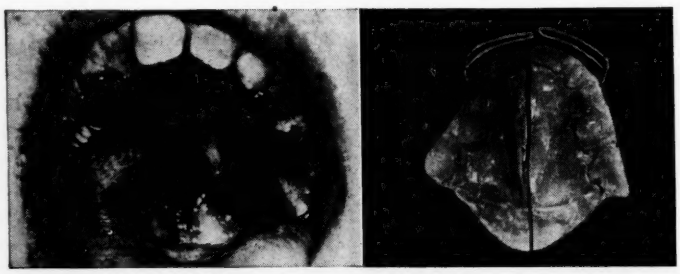

Figure 1 Left: The uvula, unable to cover the pharyngeal cavity. Right: Activator applied, reaching deep into the palate to irritate the uvula

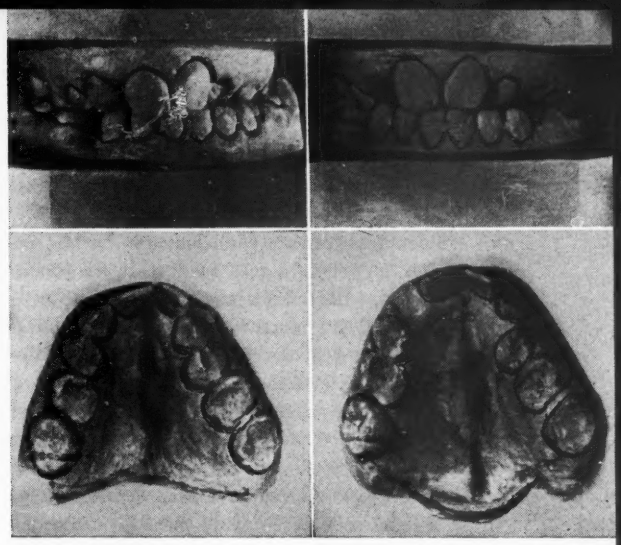

Figure 2 Left, above and below: Before treatment. Right, above and below: After four months

An unnatural air passage through the nose also causes speech disturbances. The soft palate then does not function properly. Other pathologic conditions such as congenital cleft palate, collateral symptoms after tonsillectomy, cerebral palsy, poliomyelitis, dysarthria, diphtheria, abnormalities of the jaws (malocclusion or velum deficiency), Bell's palsy, loss of hearing, and hemiplegia (producing drooling) cause difficulties in the control of pressure and direction of breathing, muscular incoordination, lack of palatopharyngeal sphincter control and other related conditions.

In the case report described, breath direction and pressure were controlled by the regular use of an activator. The patient (a girl, born two months' prematurely) had congenital clefts in the soft and hard palate. This anomaly was corrected surgically. The soft palate, however, remained imperfect, the uvula was hardly developed and therefore did not cover the pharyngeal cavity. Breathing was inadequate and was possible only by constant inhalation through the nose. The girl's voice was unintelligible and the articulation of speech defective. The deciduous dentition, as usual after early palatotherapy, was incomplete. Hopes for a total correction of speech were negligible. Before the articulator was applied, phonograph records of the patient's voice and speech defects were made. After a short time, however, an amazing improvement in speech could be observed. The voice was completely free of nasality. The sounds of W, B, P, D, N, T, and later also those of K and G, were mastered and distinct. The pronunciation of other consonants still was not perfect. The malformation of the dental arch was at that time not completely corrected but was improving. Also the exhalation of air through the nose while the girl was speaking was not fully eliminated; however, her voice was surprisingly clear in pitch and volume. Recent recordings confirm the amazing improvement.

A concept of malocclusion

A. Goldenbaum. *J.D.A.South Africa* 10:236-240 July 15, 1955

Environmental factors—habits, trauma, early loss of deciduous teeth—do not always provide a total explanation of malocclusion. Orthodontists are turning increasingly to hereditary factors to explain dentofacial abnormality. Chapman, in a systematic investigation of families, concluded "that the major causes of malocclusion are probably ante-natal, e.g. heredity and parental health and that post-natal factors are of secondary importance. . . ." Stoddard traced a maxillary protrusion through three generations. Lebow and Sawin traced the inheritance of "unusually long face" through seven generations.

A more satisfactory method of studying hereditary influence than the investigation of families is the study of identical twins. A pair of ten year old identical twins under treatment in the orthodontic department of the University of the Witwatersrand Oral and Dental Hospital showed striking similarities in arch form and dental irregularities produced by identical genetic back-

grounds. The twins have Class I (Angle) malocclusions; the irregularity of the incisors in one twin is the mirror image of the other.

Roentgenographic cephalometry further revealed the genetic forces involved in the formation of the dentofacial complex. Similarities of the skeletal and dental formation of the identical twins indicate the decisiveness of heredity in determining the dentofacial pattern. Disharmony of the facial bones affects the dental area because of the interrelation of all the bones of the face. A malocclusion is often an extreme deviation from the average, produced by a chance combination of skeletal parts. Frequently there is no obvious cause. The chromosomes of one individual are paired with the chromosomes of another, and harmony or disharmony in dentofacial make-up is the chance result of this chance "shuffle" of the chromosomes.

Orthodontics and prognathism: methods of treatment (Kieferorthopädie und Progenie: Behandlungsmethoden)

Ch. F. L. Nord, Amsterdam.
Österr.Ztschr.Stomat. 52:358-361 July 1955

Statistical reports, recently published by the Orthodontic Clinic at Amsterdam, establish that of 5,275 patients, 289 (5.5 per cent) belong to Class III (Angle's classification). Of these 289 children, 20 per cent had an inherited predisposition to prognathism; therefore, from all examined patients, 1.1 per cent presented inherited characteristics.

The following differentiations were observed: the prognathic "compulsive" bite (involuntary thrusting forward of the jaw); the deviation in upper or lower jaw, and the deviation in upper and lower jaw with prominence of the mandible.

Clinical experience proved that all three types responded favorably to orthodontic therapy when the treatment started at an early stage. Instances in which surgery was unavoidable were invariably those in which the treatment began too late.

Of the 289 patients, 131 (45 per cent) were below 7 years old; 3, below 5; 6 were 5; 39 were 6; and 61 were 7 years old; 34 were 8, 27 were 9, 11 were 10, and 16 were above 10 years old. Orthodontic treatment could achieve neither cure nor remarkable improvement in three patients who were above 16, and who presented malformations not severe enough to require surgery. In all other instances, the treatment was fully successful, particularly in patients below the age of seven.

The prognathic "compulsive" bite (thrusting forward of one of the jaws), when the patient was young, could be corrected within a few weeks. An inclined plane of acrylic resin was cemented above the lower dentition, and, when correct occlusion was not achieved by this procedure, a chin cap was used during nights to prevent recurrence. In instances of developmental prominence of the mandible, the chin cap had to be used for a longer period, at least until the permanent dentition had erupted completely, and in a few instances even until the patient reached adulthood. Prognathism develops not only through an inherited predisposition but may be caused by thumbsucking or intra-uterine conditions.

A clear distinction should be made between "true" and "false" prognathism. In both instances, however, the chin cap is the best curative procedure.

Orthodontic treatment in all instances of prognathism should begin as soon as possible; neglect may cause severe aggravation.

The 'propulsor' in functional orthodontics (Nouveaux appareillages en thérapeutique orthopédique fonctionnelle simplifées)

A. Besombes and R. Soulet. *Rev. franç.odontostomat.* 2:383-490 June 1955

No orthodontic activator has lived up to the claims of its inventor or the expectations of orthodontists that it would function properly in the majority of instances in which orthodontic treatment is indicated.

The propulsor, a recently developed apparatus, achieves favorable results in instances where the activator failed or only partially succeeded. The propulsor, although based on similar principles, is not only an improvement on the activator but, by the addition of a splint system, allows a different utilization in a more extended field.

The propulsor is applicable in instances of transversal malposition occurring in both jaws, inducing retrograde movements in sagittal and vertical malformations.

In several tests, and later also in orthodontic practice, the propulsor achieved favorable results in the correction of severe malocclusions. In instances of open bite, a comparatively short period of treatment with the propulsor obtained, if not absolute cure, at least a considerable improvement.

The most auspicious effects achieved with this apparatus were observed in instances of malocclusion caused or intensified by bad habits, such as thumbsucking, bruxism, snoring or defective breathing. The propulsor can be used with patients of any age, and it is multifunctional.

▼ Growth and development

Problems of growth and development

J. P. Walsh. *New Zealand D.J.* 51:106-108 July 1955

At conception the individual inherits a potential which sets a limit to his growth and development. It can be assumed that the genetic pattern of any individual falls short of the ideal. Although the inherited potential sets a limit to the growth and development of the individual, the realization of that potential depends on the environment. All people suffer to an unknown degree from two types of defects, inherited and acquired. An unknown factor in a developing child is the amount of unrealized potential still available for realization.

At birth 55 to 60 per cent of facial breadth is achieved, and 40 to 45 per cent remains to be achieved postnatally, as a mean average. When a child patient with a malocclusion comes to the orthodontist, he must decide how much of the defect is due to inheritance and how much to faulty environment. The answer to the first question determines the theoretical limits of success in the treatment, as it is impossible to take the child beyond the inherited potential. The answer to the second question probably sets the practical limit of the treatment lower still.

Orthodontists once thought that all could be brought to perfection, but time has exposed the fallacy of this concept. Individuals can be brought only to limits set by heredity, and these limits are unknown. When the practitioner examines a patient, he is not looking at inherited defects but at the defective realization of a defective inherited potential, a realization which depends on environment. These ideas are important not only to orthodontists but to many other aspects of life. The human race is capable of vast improvement if man only knew how to improve genetic potential and the environment that determines realization of that potential. Today the environment is changing rapidly, but without direction or purpose. Ahead lies the task of determining the ideal conditions for the full growth and development of the human race.

Variation of tooth size in the etiology of malocclusion

Anders Lundström, Stockholm. *Am.J.Orthodont.* 41:872-876 Nov. 1955

Tooth size variation may be associated with malocclusion of the teeth in two ways:

1. Tooth size in one jaw may not be in harmony with the tooth size in the other jaw.
2. Crowding may be more likely to appear in jaws having large teeth than in those with small teeth where, instead, there may be a tendency to overspacing.

To demonstrate in what way and to what extent the variability between the upper and lower teeth influences their position and occlusion, the teeth of 195 boys and 124 girls, mostly between 12 and 15 years old, were studied. The incisors and cuspids were measured to the nearest 0.1 mm. For 140 boys and 87 girls, hydrocolloid impressions were taken, and undamaged tooth breadths of the bicuspids and first molars were measured on the casts. The casts were used also for a study of tooth position and occlusion.

The only demonstrable association was between the tooth breadth ratio and the difference in crowding between the jaws (coefficient of correlation $= 0.41 \pm 0.11$). Patients with com-

paratively large upper teeth thus showed a tendency to more pronounced crowding (or less spacing) in the upper than in the lower jaw, whereas patients with comparatively small upper teeth displayed the opposite difference. An adjustment of the overbite or overjet does not seem to be the method used by nature to accommodate disharmonies in the tooth width ratio between the upper and lower jaws.

The absolute size of the teeth may influence the tooth position, even if there is harmony between the upper and lower teeth. Persons with large teeth are more likely to have crowded teeth than are those with small teeth.

The conclusion seems to be that extractions can be justified from a biologic viewpoint in those instances of severe crowding in which the crowding can be suspected to be a result of lack of harmony between the hereditary factors relating to the teeth and jaws.

Facial growth in man, studied with the aid of metallic implants

Arne Björk. *Acta odont.Scandinav.* 13:9-34 June 1955.

The mechanism governing growth in the jaws of man is studied with the aid of a new method of roentgen ray cephalometry in which small metallic implants provide a means of orientation of the roentgen ray diagram.

The metallic implants used were Vitallium pins, 2mm. long and 0.62 mm. in diameter. A small amount of local anesthetic was used in each location, and three or four of these pins were inserted in each jaw; an instrument consisting of a cylinder and a piston of the same diameter as the pins was used.

The instrument is grasped like a pencil and pressed firmly against the bone; its sharp muzzle penetrates the periostium and enters the bone, and the pin is then driven in by a tap of a lead mallet. No pain or aftereffects are felt when the anesthetic wears off.

In order to study the growth, roentgen ray exposures were made at various time intervals under controlled conditions, with the patient's head oriented in a cephalometer.

Under certain conditions the indicator pins may alter their position in the jaws, particularly if they happen to be placed in the eruption path of the teeth. This is the reason for using three or four pins in each jaw. If the indicators are found to have maintained their relative positions, this is taken as proof that they have not shifted.

Five clinical cases are described, revealing information with regard to the vertical development of the face and the mode of eruption of the teeth.—*G. Ryge*

Mandibular posterior displacement: its relationship to orthodontic diagnosis and treatment

Charles G. Sleichter. *Angle Orthodont.* 25:161-171 July 1955

The relationship of the mandibular condyle to the glenoid fossa as associated with various mandibular positions is a subject of debate. Measurements and data concerning the following are presented: (1) condylar location as related to centric position of the mandible; (2) space available for posterior condylar movement from a centric position of the mandible, and (3) condylar location associated with an anterior movement of the mandible from centric position. Seventy-one dry human skulls, 33 clinical subjects and 40 laminagrams were examined. The data indicate that:

1. Centric occlusion is closely related to a central location of the mandibular condyle in the glenoid fossa.

2. There is normally insufficient space between the posterior parts of the temporomandibular joint for significant distal movement of the mandible from a position in which the teeth are in centric occlusion. This space in the patients examined was invariably less than half the width of a bicuspid.

3. Anterior movement of the mandible from centric occlusion the width of a bicuspid places the condyle out of the normal position in its fossa and well up on the slope of the articular eminence.

4. The possibility of forcing the mandible dorsally from a normal condylar relation a distance equivalent to the width of a bicuspid is remote.

Operative dentistry

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Inlays and fillings

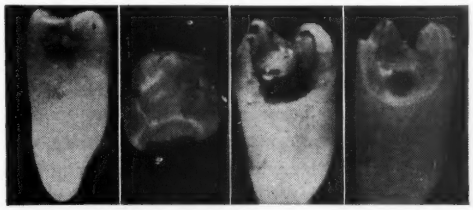
Better cavity preparation by disclosing remaining decay with Howe's ammoniacal silver nitrate

K. R. Durham. *Texas D.J.* 73:414-419 Sept. 1955

Probably more variables exist in cavity preparation than in any other dental operation, because of the various concepts of caries held by dentists. Most dentists believe they get the carious material out of a cavity. The only sure way to know is to make a chemical test. A step-by-step technic for disclosing caries in prepared cavities is as follows:

1. The cavity is dehydrated with a blast of air.
2. The concentrated roentgenogram developer is applied for 15 seconds.
3. The cavity is rinsed with water and dried with a blast of air.
4. Howe's ammoniacal silver nitrate is applied for 15 seconds.
5. The silver nitrate is then neutralized with a saturated solution of potassium iodide for 15 seconds.
6. The cavity is rinsed with water and dried with air.
7. The cavity preparation is completed. (If necessary, the staining technic is repeated several times until no black color, which indicates decay, is detected at the dentinoenamel junction.)
8. Before the cavity is filled, the anterior teeth are flooded with hydrogen peroxide (Superoxol) for one minute.
9. The cavity is rinsed with water and dried with air.
10. The usual linings and bases are applied and the cavity is filled.

Testing for decay will be a revelation to many dentists. Results are gratifying; fillings stay in much longer and there is less "recurrent" caries.



Successive steps in cavity preparation. From left to right: the tooth before preparation; the cavity prepared; decay on testing, and the final preparation

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Pedodontics

A classification and treatment for traumatized anterior teeth

Charles A. Sweet, Jr. *J. Den. Children* 22:144-149 Sept. 1955

Treatment of injuries to anterior teeth of children is of increasing concern to the dentist. The treatment plan must consist of proper operative procedures, with emphasis on the esthetic factor and the psychological treatment of the child and parent. As a common basis for discussion the author proposes the following simplified method of classifying fractures of the teeth:

Class I—a simple fracture of the crown, exposing no dentin.

Class II—a fracture of the crown, involving little dentin.

Class III—an extensive fracture of the crown, involving considerable dentin and not exposing the pulp.

Class IV—extensive fracture of the crown, exposing the pulp.

Class V—complete fracture of the crown, at or below the gingival margin.

Class VI—fracture of the root, with or without loss of crown structure.

Class VII—tooth loss as a result of trauma.

When the young patient is seen, a brief but inclusive history should be recorded. Visual and clinical examination should include classification of the injury, tissue damage, mobility, occlusion tests, and percussion and thermal tests. Roentgenograms from several different angles are necessary. Treatment procedures for each fracture classification are described. Early treatment of fractures of the deciduous and permanent dentition will in many instances prevent undesirable esthetics and possible psychological insecurity in the child.

Oral habits

Maury Massler, Hugh Kopel, Morris Kelner and Ray Werther. *J.Den.Children* 22:132-143 Sept. 1955

These comments on oral habits and the labial frenum constitute a committee report presented as part of the study project for 1954 of the American Academy of Pedodontics. Thumbsucking, lip habits, tongue habits, postural habits, mouth breathing, biting habits and fingernail biting are discussed, together with factors determining the decision as to treatment, and the types of treatment. A comprehensive bibliography of 117 articles is presented. The section on the labial frenum discusses its normal position during the primary and mixed dentitional period, its effect on alignment of the permanent incisor teeth, surgical treatment, orthodontic appliances, and the optimal time for treatment.

Dental care for the cerebral palsied

E. J. Barton. *J. New Jersey D. Soc.* 27:27-30 Sept. 1955

Technics to facilitate dental treatment of children with cerebral palsy or other types of physical affliction are discussed. There are about 350,000 persons with cerebral palsy in this country. The five pathologic types are classified according to the area of the brain where the damage occurs, and are designated as athetoid, spastic, ataxic, rigidity and tremor. Each of these states causes the child to exhibit a certain pattern of muscular behavior. The handling of the child in the chair must be based on the movement pattern which he is known to follow.

The two most common types of cerebral palsy are athetosis and spasticity. Athetosis is characterized by involuntary movement of a "wormlike" nature by the involved segments, ranging in severity from spasmodic facial grimaces to endless contortions. The patient often exhibits a constant grimace, and this involuntary movement of face, tongue and throat interferes with speech and swallowing. Spasticity is marked by muscular hypertonicity with impairment of voluntary control, particularly of the finer muscle groups. Motion is exaggerated and awkward, and is accentuated by an overactive stretch reflex which causes motions to be completed with a jerk. Ataxia appears as an interference with the child's sense of coordination and balance. Rigidity after widespread cerebral damage constitutes a muscular resistance to planned motion, giving rise to what is often described as "lead pipe" movements. Tremor, the least common of the five states, is a rhythmical involuntary motion which may be so small as to be unnoticed.

Contrary to the popular belief that cerebral palsy is always associated with a lowered mentality, actual mental deficiency in the whole group may not exceed 40 per cent. Nor is it true that such children are insensible to pain; although they have an impaired motor neuromusculature, their sensory innervation and pathways are normal in many instances. Cerebral palsy patients exhibit much the same type of dental pathology as do unafflicted children.

The child is encouraged to walk to the dental chair and seat himself. Once in the chair, he must never be left alone, for these children tend to move about in an uncontrolled manner, even more than do normal children, and are more liable to fall out of the chair. A linen binder with stirrup extension is used to aid in keeping them in the chair. Tilting back of the chair also makes it easier to maintain the child's body in a fixed position. The child's arms should be examined from time to time to see that they have not fallen back of the arms of the chair and become caught there. When the child is unable to sit alone in the

chair or keep his head upright, he is held in the lap of the parent or nurse.

The method by which the necessary degree of mouth opening is achieved depends on the child's ability to cooperate. In milder forms of the condition, no assistance at all is required. For other patients a small rubber covered bite-block with an attached recovery cord is placed. In severe cases a springlock type of mouth opener may be necessary. A metal finger protector with two or three rubber finger cots to prevent chipping of the teeth and slipping of the protector may also be used. This is placed on the forefinger of the left hand and inserted between the teeth in the molar region of the nonoperative side. It serves to maintain the jaw opening and protect the operator's finger. Metal mirrors should be used, as they will not splinter if broken in the mouth. The neck of the mirror holder can be bound with gauze to prevent tooth damage in case of traumatic closure.

The taking of intraoral films is best achieved by mounting the film in a hemostat, which is held in place by the child's parent. If an intraoral film is impractical, a lateral jaw film should be attempted. The child's parent is shown how to steady the child's head and hold the film, and exposure time is kept to a minimum. Where local anesthesia is indicated, a short heavy gauge needle is best. A 1¼ inch no. 22 needle, mounted in a 1 inch hub, allows just enough of the needle point to enter the tissue to deposit the anesthetic solution.

The operative procedure is usually complicated by excessive salivation and the production of a heavy white mucoid substance. Mechanical aspiration is necessary. The movement of the child's head can be controlled by tucking it into the crook of the operator's shoulder and by a firm grip with the operator's mirror hand. Where cotton rolls are used to help stem salivary flow, each should be tied with a piece of cotton thread or dental floss which is allowed to hang out of the corner of the mouth. As speed is necessary, the packing of the amalgam is best accomplished with the operator wielding the packing instrument while the amalgam is placed by his assistant. Operations such as pulpotomy are virtually impossible and are attempted only where a great deal of cooperation and control are available. There are instances in which the degree of muscular involvement is so considerable that the physical and psychic trauma to patient and operator outweighs the poor results obtained. Such patients are best treated under general anesthesia. Care is taken that adequate oxygen is available at all times, otherwise further damage may occur at the centers of original injury. Standard general anesthetic technics are used; much less of the anesthetic agent is required than for unafflicted children of the same age and weight group.

It is within the province of the average practitioner to treat such of these patients as may present themselves and to provide at least a form of amelioration until a more complete service is possible.

Procaine and propoxycaine as local anesthetic agents in children

(Procaina y propoxycaina como agentes anestésicos locales en niños)

F. García Godoy and Evalina Duval.
Odontoiatria, Madrid 12:207-211 No. 136(4) 1955

A comparative study of a propoxycaine preparation (diethylaminoethyl-4 amino-2 propoxybenzoate hydrochlorhydric) and procaine was made in 200 children ranging in age from three to 12 years who had extractions of temporary or permanent teeth. The anesthetic technic consisted of infiltration except for the lower bicuspids and molars, for which mandibular anesthesia was used. Some extractions were made at once, that is, in 40 seconds with infiltration and in three minutes with mandibular anesthesia, although the usual minimum time required for anesthesia of this type is from eight to 14 minutes; others were made one hour after the child was anesthetized.

Results were considered satisfactory when the extraction and instrumentation were painless, and deficient when additional anesthetic was required. The new anesthetic (propoxycaine) was given to 100 children, in 56 of whom the extractions were performed at once. The other 100 children received the control anesthetic (procaine), with immediate extractions in 45. Analysis of the

results showed that propoxycaine was satisfactory in 96 per cent of the patients where extractions were performed immediately and in 98 per cent of those when extractions were performed after an hour. The corresponding figures for the control group were 98 per cent for each type of extraction. These observations are considered preliminary, because definitive evaluation of the new anesthetic will depend on further study and possibly on the use of other technics. The fact that no instances of fainting, emphysema, shock, or any other serious side effect were seen substantiates the authors' belief that such accidents are infrequent in children.

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Rehabilitation or equilibration

Attritioning of teeth

Alexander Weinberger. *Oral Surg., Oral Med. & Oral Path.* 8:1048-1059 Oct. 1955

Attritioning is defined commonly as the loss of tooth structure resulting from friction between the tooth surfaces during mastication. It is distinguished from wear caused by abrasion (the mechanical wearing of tooth substances) and erosion (the chemical wear caused by the formation of acids in the mouth).

A theory, based on the study of the teeth found in the skulls of primitive man, holds that attritioning with an edge-to-edge occlusion in the incisive region is the adult stage of development commonly seen in persons over 40 years of age. A concept of the function of the teeth in mastication is presented in contradiction to this and similar theories that the teeth become abraded during the normal processes of mastication. An etiology is established and a treatment formulated. The author's concept is based on the premise that the teeth do not strike during mastication, and that attritioning is a symptom.

There are two factors that appear to be responsible for attritioning: (1) dysfunctional or nonmasticatory habits (bruxism or bruxomania), and (2) the hardness of the teeth. The etiologic basis of the habit of clenching or grinding the teeth is an emotional disturbance, the problems of daily life being the underlying cause.

The physiologic type subject to attritioning of the teeth can be characterized. The person has a ruddy or jaundiced complexion, the facial contour is round or square, and the gonion angle is a right angle. Yellow and reddish-yellow hues predominate in the tooth shades. The muscles of mastication and the jaws are well developed. Such persons have emotional "drive," the desire to lead and amazing energy. Systemically, hypothyroidism, a low vitamin A level, and a low hydrochloride level are concomitant symptoms. The teeth are soft. Invariably, such persons are vigorous toothbrushers.

Treatment falls into three categories: mechanical, systemic and psychiatric. Some control can be achieved by constructing removable splints that are worn by the patient during sleep and sometimes during waking hours. Where there is extreme attritioning, the mechanical treatment of choice for restorative purposes is full coverage simulating the normal anatomy of the teeth. The systemic treatment involves the increase of vitamin A intake, and increasing the thyroid activity and the hydrochloric level under the supervision of the patient's physician. Psychiatric therapy is the treatment of choice in order to eliminate the etiologic factor which is emotional.

Three-dimensional registration of the condylar course (Die dreidimensionale Kondylenbahnregistrierung)

R. Weber. *Schweiz.Monatsschr.Zahnhk.* 65:499-542 June 1955

Face-bow measurement for recording lateral movements of the lower jaw often results in erroneous projection, and therefore a three-dimensional registration is essential for accuracy. The registering instrument, designed by the author, seems preferable to the conventional articulators. The indicating points contact electromagnetically the recording level and exert neither traction nor shifting. A correct evaluation is achieved either by descriptive geometry or by the "masticator" method for laboratory control.

The recordings of ten patients with natural teeth, by application of the Bonwill triangle,

produced interesting data. The conventional articulators registered only uniform patterns. Although the number of the recordings was too small to establish all possible variations, the results indicate that the classical theories of articulation should be revised. The summary of the experiments is as follows:

1. Three patients displayed lateral movements and functional excursions similar to these established by Gysi's articulation theory, although in all three instances the transversal movement of the "resting" condyle (on the same side as the mandibular excursion) was considerably more pronounced than expected. Two of the patients showed in the "swinging" condyle an even greater lateral than sagittal movement. The conventional articulators, however, registered no differences.

2. The fourth patient revealed no variation of lateral and sagittal movement in the "swinging" condyle.

3. The next four persons displayed a different variation: The "resting" condyle was frontally displaced, projecting over the "swinging" condyle. The course of movement and the symphysial points shifted in different levels and at different angles. The three points ("resting," "swinging" condyles and symphysis) did not rotate around the same hypothetical axis. This observation is in direct contrast to Gysi's articulation theory.

The experiment clearly proves that the method of registering mainly or only the sagittal condyle course, and transposing the recording to the articulator, is of secondary importance. In all instances, the three-dimensional registration method demonstrated more accuracy. Whenever it is necessary to register every movement, and in instances in which complete natural dentition still exists, the recordings should be made by the three-dimensional method. Spot grinding of and in the mouth should eliminate many recording errors. "Bite raising" should be introduced after the three-dimensional recording of all alterations in articulation. It hardly seems possible, however, to produce an artificial tooth, adaptable in all instances, without grinding, although certain improvements in the occlusal angulation of artificial molars and bicuspids seem possible.

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Caries pathology

Buffering systems in the mouth

B. Lilienthal. *Oral Surg., Oral Med. & Oral Path.* 8:828-841 Aug. 1955

Saliva possesses considerable ability to maintain its pH unchanged because of the presence of these buffer substances: bicarbonate, calcium phosphate, protein, mucoid and ammonia. The buffering property of salivary sediment is due in part to adsorbed bicarbonate; that of the dental plaque, to the bacteria it contains. The effect of two conditions on the buffering effect of saliva in the mouths of 15 children was observed: (1) eating a meal and (2) chewing paraffin wax. Saliva was collected immediately before and after the children had eaten a meal. In five children the buffering effect (pH 7.0 to 6.0) was greater after the meal than before it. No appreciable change was found in the other ten children. The subjects chewed for approximately 20 minutes without a consistent change in buffering effect.

Paraffin-activated saliva, collected from the same subjects during a period similar to that taken for the meal, did not show any appreciable changes in buffering properties, as determined by comparing the first and last five-minute samples of saliva. During the test period, however, changes were observed which were paralleled by changes in bicarbonate concentration. Bicarbonate was the only variable among the anionic constituents of the salivary buffer systems. No consistent relation was found between bicarbonate, sodium and potassium ion concentrations and volume of sample.

In a study of the correlation of the buffering effect of saliva with the caries incidence of 65 children, it was concluded (1) that some of the children were caries-free, although the buffer test showed them to be susceptible, and (2) other children had new lesions, although they were classified by the buffer test as caries-immune. Susceptibility to dental caries may be due to a disturbance of the dynamic equilibrium between acid production and neutralization on the tooth surface, the determining factor being the rate of acid formation rather than the buffering effect.

Basic science

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Pathology

More than 30 supernumerary teeth: report of an unusual, probably unique case

(Über den seltenen, vielleicht einmaligen Fall von mehr als 30 überzähligen Zähnen)

Clemens Bellinghausen. *Zahnärztl.Welt* 10:391-393 August 10, 1955

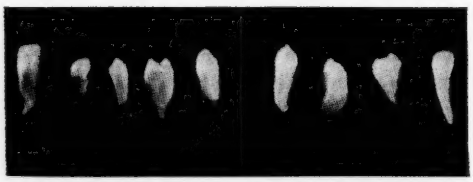
Although reports on supernumerary teeth have been published frequently, the occurrence of more than 30 such teeth in one patient seems to be unique.

Many authors maintain that the anomaly of excess teeth is caused by an atavistic process: human dentition at a prehistoric period was ostensibly composed of at least 44 teeth. In the course of evolution, man has lost 12 of these teeth. According to this theory, supernumerary teeth are reappearing "lost" teeth, trying to erupt into the formerly held position.

The patient, born November 11, 1926, by occupation a turner, medium-sized, healthy and in perfect nutritional condition, was seen on June 21, 1954, with a painful swelling in the region of the upper left first bicuspid. Examination showed that the upper left first bicuspid was loosened by suppurating infection. An immediate extraction, executed without difficulty under local anesthesia (Chlorethyl), was necessary. After a week, considerable pain in the wound, which caused sleepless nights, brought the patient again to the dentist's office. Because the left upper jaw was toothless, the suspicion that the extraction had disturbed an impacted tooth seemed justified. Roentgenograms were made of the region from the cuspid to the first molar that indicated the presence of at least six impacted supernumerary teeth. These teeth also were successfully removed. A short time later, the patient again came to the office, demanding that his last lower left bicuspid be extracted. Roentgenograms of the region between incisors and molars led to the conclusion that nine supernumerary teeth were impacted in one half of the lower jaw on the left side. These teeth varying in length from 15 to 22 mm., in width from 7 to 11 mm., were removed. Roentgenographic examination of the anterior region disclosed at least eight more supernumerary teeth. Before the first extraction, the patient had only four normal permanent teeth left in the left side of the maxilla. In the remaining three quarters of the jaws, there were still many supernumerary teeth, as yet not counted.

Examination of the patient's mother, who apparently was toothless, showed two supernumerary teeth in the upper incisor region, three in the left upper molar region, one in the right upper molar region and two in the left lower molar region.

The case reported seems to furnish proof that cumulative or immediate heredity causes the occurrence of supernumerary teeth; the ultimate cause for the multiplicity of supernumerary teeth, however, still is an enigma.



Supernumerary teeth from the left upper jaw

Sjögren's syndrome in medical and dental practice (Das Sjögrensche Syndrom in der medizinischen und zahnärztlichen Praxis)

W. Achenbach and G. Stollberg. *Deut.med. Wochenschr.* 47:1745-1760 June 1955

Sjögren's syndrome, characterized by a constant dryness of mucous membranes resulting from the deficient secretion of many glands, especially the lacrimal and salivary glands, occurs often in women during pregnancy or menopause. In many instances, arthritic disorders, resembling chronic villous polyarthritis in the primary stage, appear simultaneously. These symptoms are recognizable in mucous membrances of the respiratory tract.

The specific and characteristic phenomena of this symptomatic complex are dryness of eyes, mouth and nose, conjunctivitis, rhagades and glossopyrosis. The complete dryness of the oral mucous membrane often causes severe pain underneath artificial dentures. In other instances, with a parallel clinical course, loss of teeth and dysphagia occur. Whenever the symptoms of dryness in the oral cavity and glossopyrosis do not respond to the usual treatment, Sjögren's syndrome can be suspected as the causative factor. Dentists, however, usually have had no significant experience in the therapy of Sjögren's syndrome. Treatment, therefore, belongs in the field of internal medicine.

Normal and abnormal midregion of the mandible: hamulus and diastema (Normale und abnormale Unterkiefermitte: Hamuli und Diastema)

G. Politzer and J. Weitzenberg. *Deut. zahnärztl. Ztschr.* 10:810-812 June 1, 1955

Anomalies such as agenesia, multiplication, transposition and retention may affect all teeth. There is, however, a relation between certain anomalies and specific tooth groups. Agenesia occurs mainly in lower incisors, and retention in upper cuspids. The anomalies of the mandibular midregion are divided into two groups: medial diastema and supernumerary teeth. Hamular processes, caused by diminution of Meckel's cartilage, occur in embryos of 45 mm. crown-rump-length (c.r.l.). When the embryonal measurement reaches 94 mm. c.r.l., hamuli are already situated in the cuspid region, and no cartilage exists in the incisor region. Between these hamuli lies a stratum of perichondrium, so that in man (in contrast to the rat) no cartilaginous connection can be observed.

In the development of Meckel's cartilage, a specific gradient occurs, progressing in dorsoventral direction. The sigmoid notch appears in the midregion. The mandibular skeleton is then cartilaginous; the midregion still is precartilaginous. Meckel's cartilages meet in the midregion, and hamuli are formed. Usually these cartilages do not coalesce and are separated by a common perichondrium (in contrast to the rat).

In embryos of 44 mm. c.r.l., hamular processes diverge on both sides, forming in the interval three strata of connective tissues: the perichondrium (on both sides), and a zone of loosely arranged cells. The median diastasis of embryos of 94 mm. c.r.l. corresponds exactly with the interval between the cuspids. Dentition develops apparently in the proximity of Meckel's cartilage which occasionally is close to tooth germs, the perichondrium being connected to dental follicles. Anomalies in the submaxillary midregion are usually caused by the premature disposition of hamuli.

An overexpansion of the midregion often leads to diastema, and this is an important factor in the potency of tooth formation, dormant in the dental lamina, sometimes causing the development of wedge-shaped teeth. Occasionally when the hamular process recedes prematurely, the close connection between the cartilage perichondrium and dental germs or dental lamina causes loose particles to cling to the cartilages.

Eosinophilic granuloma of the upper jaw (Granulome éosinophile de l'os maxillaire)

P. L. Maronneaud. *Cah.odont.-stomat.,Marseille* 5:29-34 June 1, 1955

The eosinophilic granuloma, a type of xanthomatosis, is characterized by rarefactions and an excess of lipoids due to disturbance of the lipoid metabolism. It often presents dilated gaps caused by an osteolytic process, a dissolution of osseous tissues and loss of calcium in bony structures. The

eosinophilic granuloma gradually destroys the alveolar bone, and loss of teeth occurs.

Histopathologic examination of a large upper molar shows lesions of the pulp and osseous tissues, a collateral hyperemia with an edema in the midsection, and in parietal sections and the palatine radicular region, fibrous structures. Mineral impregnation appears in the pulpal center in the form of an articular lamella. Along the radicular capillaries this lamella becomes visible. No further accumulation of eosinophilic cells can be observed. Traumas of osseous tissues at the palatine level, after having destroyed two thirds of the coronion, reveal cell destruction by an antibody, the alpha lysin. In the involved strata, a complete reconstruction of osteofibrous tissue takes place, surrounded by granulated tissue and representing an eosinophilia. Pulpal changes are influenced by adjacent lesions. Such alterations are not unusual, and establish a counteracting process. In the enamel, however, carious defects often appear.

It is surprising to perceive in the center of destruction this osteogenic reconstruction, which not only rebuilds the destroyed parts but reproduces these segments according to their original structure.

Diagnosis of lupus erythematosus

G. L. Pease. *Illinois M.J.* 108:56 Aug. 1955

Symptomatic lupus erythematosus, a superficial inflammation of skin and mucous membrane marked by disklike patches with raised reddish edges and depressed centers, and covered with scales or crusts, is a disease of unknown cause. Aggravating factors are focal infections, exposure to sunlight or severe cold, various allergic reactions and surgical procedures. Constitutional symptoms, occurring during the active phases are fever, weakness, fatigue, prostration and loss of weight. Arthralgias and joint symptoms are seen in many of the patients, and it is often difficult to distinguish between systematic lupus erythematosus and rheumatoid arthritis, without prolonged follow-up examination and observation. Various cutaneous manifestations have been described, especially the classic phenomenon of the "open butterfly wings" on the face. Other signs of disturbances of the central nervous system or of lesions of the pulmonary and cardiovascular systems occur frequently. Lymphadenopathy and splenomegaly occur in more than 50 per cent of the patients. In 1948, Hargraves and associates described a specific cell in the buffer layer of osseous marrow, taken from patients who had acute or subacute lupus erythematosus. This cell, known as the lupus erythematosus cell, is a mature polymorphonuclear leukocyte containing an ingested or lysed mass of homogeneous, pale-purple material, and is thought to be of a nuclear origin.

Arthritis of the temporomandibular joint: diagnosis and management

Don H. Bellinger. *J.South.California D.A.* 23:19-31 July 1955

The fundamental principles of temporomandibular joint disease have been slow in coming into focus. Early literature was based on clinical impressions that were not always valid. There has been a delay in applying to the temporomandibular joint knowledge that applies to diseases of other joints. Most cases of arthritic involvement of the temporomandibular joint fall into one of four major groups: traumatic, infectious, rheumatoid, or degenerative. The etiology, pathology, symptoms, roentgenographic observations, treatment and prognosis of each of these groups is presented tabularly.

Treatment in acute traumatic disease consists of rest, cold applications in the early stage, heat applications in the later stages, and the administration of analgesics. Treatment for infectious arthritis is directed both symptomatically and locally. The affected joint should be at absolute rest; passive motion should be allowed as soon as painless movement is possible. To minimize destruction of joint tissue, it is important to initiate treatment early in the course of the disease.

Rheumatoid arthritis is a disease of temperate climates, has a familial tendency and affects three times as many women as men. Most instances of the disease occur between the ages of 20 and 50. Measures of proved value are rest, physical therapy, psychotherapy, orthopedic care, chrysotherapy, roentgenographic therapy,

ACTH, cortisone and hydrocortisone. The prognosis is guarded.

Degenerative joint disease is associated with physiologic aging. Joint aging begins in the second decade of life and is universally present after the age of 40. This disease is chronic and cannot be cured; nevertheless, much can be done to relieve symptoms and to retard progression of the pathologic conditions. Treatment includes rest, heat, correction of abnormal functional mechanics, analgesics, hydrocortisone, and, where these fail to control the pain, surgical intervention.

Effects of smoking on the oral mucosa

A. Budner Lewis. *Oral Surg., Oral Med. & Oral Path.* 8:1026-1033 Oct. 1955

The effect of smoking on the oral mucosa depends chiefly on the susceptibility of the individual and the amount of tobacco used, regardless of the method of use. A classification of epithelial responses is proposed, as follows:

Hyperplasia—the initial reaction of mucous membrane to irritation. This is only an overgrowth of the prickle-cell layer.

Hyperkeratosis—the development of a definite, sharply outlined, white patch. Microscopically there is an increase in thickness of the keratin and granular layer, with no inflammatory or invasive activity.

Leukoplakia—the stage at which hyperkeratosis with inflammation appears. The plaques are indurated and raised.

Dyskeratosis or neoplastic stage—the lesions may be verrucous and papillomatous; ulceration and spontaneous desquamation may occur.

Early epidermoid carcinoma—clinically these lesions can appear like the ones just described.

Five cases are discussed. The gross lesion may appear in forms ranging from a simple, grayish white patch to a large, angry-looking, papillomatous growth. The lesion, regardless of clinical appearance, may disappear entirely after smoking has been discontinued. Even simple-appearing lesions may be precancerous or cancerous. The diagnosis should be made microscopically. Persons susceptible to keratosis should avoid excessive smoking.

▼ Bacteriology

Acute osteomyelitis of the maxilla in infancy with cavernous sinus thrombosis

Leonard Haas. *Brit.Med.J.* No. 4933:245-246 July 23, 1955

Twenty-one cases of acute osteomyelitis of the maxilla in infancy have been described in the English and American literature since 1928. Penicillin-resistant strains of *Staphylococcus aureus,* the usual etiologic agent, have been encountered with increasing frequency of late. There is described a case of osteomyelitis of the maxilla caused by penicillin-resistant strains of *Staph. aureus.* The combination of edema of both eyelids, bilateral proptosis, diminution of the ocular movements, engorgement of the retinal veins, and bulging of the fontanelle indicated that cavernous sinus thrombosis had occurred. Treatment included the administration of oral chlortetracycline, intramuscular streptomycin, intravenous heparin, chloramphenicol and oral phenindione. The effectiveness of combining antibiotic and anticoagulant treatment in the majority of instances of cavernous sinus thrombosis in adults is well established. There appears to be no previous reference to this condition in early infancy. The case illustrates the importance of basing the antibiotic treatment on bacteriological sensitivity tests.

The occurrence of bacteria in gingival pockets (Forekomsten av bakterier i tannkjøttslommer)

Emil Steen. *Norske Tannlaegeforen. Tid.* 65:230-243 June 1955.

For the understanding of infections in the gingiva, it is important to know whether bacteria may occur and persist in the normal gingival pocket. Waerhaug, in 1952, disputed Gottlieb and Orban's theory of organic attachment of the gingival epithelium to the surface of the tooth. It was therefore logical to examine whether bacteria occurred or could persist in the capillary space between the tooth and the epithelial tissue.

Five young dogs were used to study whether bacteria occurred in their gingival pockets when no calculus was present. Forty-three out of 46 tests taken from clinically fresh pockets did not give bacterial growth on glucose broth over a five day interval at 370° C.

Various bacteria were then introduced in the gingival pockets. The bacteria used were *Streptococcus hemolyticus* (Lancefields groups A and G), *Streptomyces thermophilus* and *Klebsiella ozaenae*.

After various periods of time (a half hour to several days) tests were made and the specimens inoculated on glucose broth.

Bacterial growth was observed to decrease with time. After two days 29 of 32 pockets had become sterile. In human beings with sound gingival tissue, 48 gingival pockets gave 47 sterile tests. In patients with subgingival calculus and periodontal disease, 29 out of 30 gingival pockets showed bacterial growth. In patients where calculus had been carefully removed three days before, 178 pockets out of 240 gave sterile tests. Out of 85 pockets on teeth with artificial crowns, 61 had no bacterial growth.

Histological examination showed regeneration after 48 hours.

It was concluded that gingival pockets without subgingival calculus are sterile. If bacteria are introduced, the pockets become sterile in a few days. Pockets with subgingival calculus usually contain bacteria. If the calculus is removed carefully, the pockets will again become sterile.—*G. Ryge*

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Chemistry

Prenatal ingestion of fluorides and their transfer to the fetus

R. Feltman and G. Kosel.
Science 122:560-561 Sept. 23, 1955

Results are presented of an investigation of the relation between maternal ingestion of fluorides, placental storage, transplacental passage and fetal cord blood levels. Four groups of pregnant patients were used. The first group was fed one tablet, containing 2 mg. calcium fluoride or 2.2 mg. sodium fluoride, each day. The second group received no fluoride and served as control. The third group drank fluoridated water, and the fourth group, nonfluoridated water.

About 25 to 50 ml. of blood was expressed from the umbilical cord after it had been severed and sections of approximately 25 Gm. of tissue were taken from the periphery of the placenta. The ingestion of tablets containing fluoride, and of fluoridated water, produced increases in the blood fluoride concentration of 150 per cent and 75 per cent, respectively, whereas the placentas showed increases of only 10 per cent and 25 per cent, respectively.

Two placentas, one from the tablet study group and one from the tablet control group, were taken at random and analyzed completely by sections for their fluoride content. In both instances the fluorides were more concentrated in the periphery of the placenta. The placenta may serve as both a storehouse and a regulator of the fluorides.

Fluorides in everyday life

Nicholas C. Leone. *Texas State J.Med.*
51:457-460 July 1955

Approximately 0.1 per cent of the earth's crust is composed of fluoride in different forms. High concentrations, in the forms of cryolite and fluorspar, are mainly in Greenland, India, Africa and China. Extensive fluorspar deposits in Illinois and Kentucky have been mined for more than 100 years. Nearly all foods and many waters used for domestic purposes contain fluorides. Fluoride compounds are used extensively in the manufacture of aluminum, steel and heavy metals. Fluorine is a constituent of many refrigerants, fire extinguishing agents, insecticides, rodent poisons, fertilizers and feed supplements for large animals. Fluorine is freely distilled in the air by some oil and metal industries, gold and silver smelters, chemical industries, brick and cement works.

More than a thousand communities in the United States have been using for many years local water supplies containing natural fluorides varying from a trace to 16.0 ppm. The first me-

chanical addition of fluoride to a public water supply was in January 1945 in Grand Rapids, Mich. In the next ten years, there were 1,066 communities with a total population of 20.45 million persons in the United States receiving added fluorides in their drinking water.

Studies concerned with the physiologic effect of fluorides on cryolite miners constantly exposed to dust containing high concentrations of fluorides have been quoted to oppose the judicious use of trace amounts of fluoride in domestic water supplies. The two problems are entirely different. From studies recently completed relating to the toxicology and pharmacology of fluorides in man and animals, it can be stated that "no clinically significant physiological or functional effects resulted from prolonged ingestion of water containing excessive fluorides, except for dental fluorosis."

▼ Biology

Biologic research on hard tissues

(Die Grundlagenforschung der Hartgewebe im Lichte der modernen Forschungsmittel)

O. Eichler. *Schweiz.Monatsschr.Zahnhk.* 65:611-620 July 1955

In recent years, various new methods for biologic research, such as the diffraction of roentgen rays, electron microscopy, radioactive isotopes and radioautography, have been developed. It is now possible to acquire a more profound knowledge of the basic structure and the metabolism of the hard tissues.

Debye-Scherrer's diagrams identify the resistant and hard elements of osseous structures of the apatite group, especially of carbonate apatite, and establish the location of different ionic atoms in a crystalline network.

The exact dimension of the crystals is revealed by the electron microscope. Through both methods, an excellent picture of the mineral constituents of hard tissue and of the development of the surface is achieved. In regard to the absorption of radioactive isotopes (Ca^{45} and P^{32}) the exchange of the surface ions and their integration into the crystalline system now can be clearly distinguished. Theories on ossification can be verified or rejected.

The use of isotopes permits a more intensive study of the metabolism of all dental structures. The problem of nutrition of the dental enamel, however, appears to be insignificant. Enamel has a low permeability, especially at the dentin level, and the important exchange of the radioactive isotopes can be observed.

Biologic characteristics of disinfectants

(Die biologischen Eigentümlichkeiten der Desinfektionsmittel)

A. H. Hattemer and Th. Lammers. *Österr.Ztschr. Stomat.* 52:382-383 July 1955

Disinfectants act either by destroying infective agents (pathogenic microorganisms) or by a denaturation of albumin and all vegetative forms, independently of propagation or immobilization. Some disinfectants, however, effect only an incomplete disinfection, leaving the spores and the resistant resting cells uninjured. The prerequisite for a complete destruction of pathogenic germs is the full access to the microorganisms, invading through the protective mucus or stratum layers, and annihilating the vegetative forms of the microorganisms as well as their spores.

Chemotherapeutic agents injure the causative organisms but do not harm patients; these agents act better *in vivo* than *in vitro*. They influence primarily the bacterial growth, making it possible for the defense mechanism to destroy the germs. Chemotherapeutic agents are synthetically produced chemical compounds; antibiotics, however, are obtained biologically from lower plant cells (bacteria, yeasts and molds) and are antagonistic to pathogenic or noxious forms, being biostatic or biocidal. These disinfectants are seldom toxic; their therapeutic application, however, is objectionable because they may destroy the oral microflora and can cause allergic manifestations. Antibiotics are mainly bacteriostatic in action, sometimes—in stronger concentrations—even bactericidal.

Antibiotics as well as chemotherapeutic agents may produce resistance which will increase by a

continued medication. Therefore, neither antibiotics nor chemotherapeutic agents should be used on the surface of mucous membranes because both render albumin and other vegetative ferments inactive; both should be applied only after establishing that neither damaging effects on tissues nor collateral reaction can be expected. These disinfectants act more favorably when administered parenterally than when given by local application. Penicillin G or O achieves satisfactory results in the treatment of focal infections, and is bacteriostatic for numerous bacteria and other microorganisms. Secondary effects and increased artificial immunity, however, have been observed. Penicillin is inactive in the elimination of monilia (*Candida albicans*) in the oral cavity. There may be an overgrowth of fungi after the destruction of the natural antagonistic oral flora, often inducing pulmonary complications. Tyrothricin is preferred because it produces only a few side reactions and can be applied locally. Since tyrothrycin is not used frequently, any acquired resistance would not be important. Chemotherapeutic agents and antiseptics are useful in disinfection of root canals.

An exaggerated use of antibiotics may produce complications that, without correct and immediate therapy, can lead to serious or even perilous conditions.

▼ Anatomy

Temporomandibular joint

Clement Staley and Richard J. Lynch. *Iowa D.J.* 41:192-199 Aug. 1955

The anatomy and pathology of the temporomandibular joint are reviewed in detail. The articular disk or meniscus, articular capsule, sphenomandibular and stylomandibular ligaments and the synovial membranes are defined. Innervation and vascular supply of the joint cavity are discussed, together with the role of muscle action in movements of the temporomandibular joint. A roentgenographic technic for obtaining a lateral view of the joint is recommended. The apparatus consists of a head positioner with cassette holder, suspended above the dental chair from a ceiling support. Dislocations of the joint are reviewed, and reduction by traction and reduction by manipulation are described and illustrated. The etiology and diagnosis of subluxations are presented, together with indications and contraindications for treatment. Methods of treatment are listed. Probably the treatment of choice is that introduced in 1937 by Schultz, consisting of the introduction of a sclerosing solution such as a 5 per cent solution of sodium psyllate emulsion (Sylnasol) into the joint capsule. The technic of the injection is described and illustrated.

On the indexes of Berger and Izard in Finnish and Lappish skulls (Bergerin ja Izardin indekseistä suomalaisessa ja lappalaisessa kalloaineistossa)

Kalevi Koski and Antti Telkka. *Suom. hammaslääk. toim.* 51:1-7 March 1955

Many investigations to discover relationships between dental and facial measurements sufficiently valid to serve as therapeutic norms have been reported. Although Berger's and Izard's indexes are perhaps best known, their usefulness has been disputed. This study was undertaken to establish what significance these indexes might have in Finnish and Lappish skulls.

The material consisted of 174 unselected Finnish and 58 unselected Lappish adult skulls. The bizygomatic breadth, the maximal breadth of the dental arch, and the maximal breadth of the alveolar arch were measured, although all three measurements could not always be made in each of the skulls. Statistical handling of the measurements followed standard procedures, and the significance of the results was evaluated. The range of variation, the mean, the standard deviation of the mean of the measurements, and the indexes of both groups of skulls were tabulated, as were also the correlations between the index components and indexes in both groups of skulls. Finally, a graphic study of the indexes was made.

Although according to Berger the index should be three, it proved to be considerably lower, suggesting that the zygomatic arch is generally less than three times the breadth of the dental arch of

the upper jaw, even allowing for some racial differences. Similarly, the average Izard index proved to be somewhat lower than the value given by Izard. The means and ranges of both indexes in the present study differed from the findings of both Berger and Izard. The correlations between the components of both indexes, as well as the correlations between the indexes themselves, were insignificant. Because of the distorted distribution of both indexes, their composition is unsatisfactory. This study would appear to indicate that the indexes of Berger and Izard, so far as the dentofacial anatomy is concerned, fail to fulfill the standards of a therapeutic norm.

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Anthropology

The excavations at Ternifine-Palikao: the Atlanthropus mauritanicus (Les fouilles du Ternifine-Palikao: l'Atlanthropus mauritanicus)

P. Arambourg. *Rev.franç.odontostomat.* 2:927-937 Aug.-Sept. 1955

During the recent excavations at Ternifine-Palikao in Algeria, Northwest Africa, a few human fossils, mainly consisting of mandibular bones in an excellent condition, were exhumed. Anthropologic examinations of these jaw fragments proved that the remains originated from two prehistoric human beings of different sex of an up to now unknown ancient species of man, probably existing about 500,000 years ago. These fossils show many characteristics resembling those found in Asia which already have been classified as belonging to another prehistoric species of man termed *Pithecanthropus* (*Sinanthropus* or *Maganthropus*). Many different features, however, prevent an absolute identification of these recently unearthed African fossils with the already anthropologically classified Asian prehistoric human species, and therefore the new classification of *Atlanthropus mauritanicus* unquestionably is justified.

The Ternifine-Palikao fossils are especially remarkable for their great deviations from the norm, such as an unusual firmness of all osseous structures, an extreme bulkiness of mandibular bones, and an enormous width but a lack of height of the ascending ramus. Macrodontia and brachygnathia could be observed. The dental arch of the excavated mandibles of *Atlanthropus mauritanicus* presents a continuous row of teeth. The size of the bicuspids, the appearance of several deep folds in the basal ridge of all teeth, and the morphologic structure, distinguish the *Atlanthropus mauritanicus* from modern man, and resemble some of the characteristics found in *Sinanthropus*. The enormous size of the molars and the position and number of the cuspids (there were six), however, separate this African genus from all earlier discovered Asian prehistoric species. The immense width of the pulp chambers also seems to be one of the unique features of the *Atlanthropus mauritanicus*.

The importance of the study of occlusion to the practice of dentistry

Thomas J. Luby. *J.Canad.D.A.* 21:512-517 Sept. 1955

After a discussion of the effect of evolution on man's masticatory apparatus, the dynamics of tooth form and function, the anatomy of the temporomandibular joint and the etiology of periodontal disease, it is concluded that there is no tangible evidence to support the somber view that man's teeth are undergoing drastic evolutionary changes leading to complete degeneration with the ultimate disappearance of many or all the teeth from the human mouth. On the contrary, an increase in man's brain size brought about a dietary change which was reflected in a diminution of the cuspids resulting in more complex movements of his lower jaw and an increased function of his temporomandibular joint.

Tooth form and function have evolved to give man a masticatory apparatus which is capable of multiple cusp contact for all positions possible within the chewing range of the mandible. Proper temporomandibular joint function depends on the occlusal relations of the teeth. In the harder tissues of the body, strain and pressure have been potent factors in the determination of form. Primitive peoples whose diet through circumstance

contained coarse abrasive elements requiring extensive communitions gradually developed greater mobility of the jaw.

The pattern of the molar teeth and the structure of the temporomandibular joint became modified through strain and pressure. Bone changes can be accomplished within the life span of one person, whereas other changes in the masticatory apparatus may be manifest only after many generations. The study of occlusion is important to the practice of dentistry for it provides the practitioner with further insight into the etiologic background of dental diseases. It aids in making a more accurate diagnosis and provides a tangible basis for prognosis.

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Psychology

Dentistry and psychopathology
(Zahnheilkunde und Psychopathologie)

Brunno Acht. *Österr.Ztschrft.Stomat.* 52:386 July 1955

Mental emotions, disturbances and excitement influence the activity of the glands and the constant afflux of the vascular supply, especially in the region of the central and vegetative system. Even the endocrine glands are often affected and may cause periodontitis or periodontosis. Practicing dentists frequently observe that pathologic fear of dental treatment can produce an aggravation of pathogenic phenomena.

An inferiority complex, accompanied by unhealthy appearance and insecure behavior, may imitate the symptoms of psychosis. The patient fears existing and imaginary diseases not only in the oral cavity. Another disturbing condition is caused by malfunction of voluntary and involuntary muscles of the temporomandibular joints, making construction, fitting and wearing of dental prostheses intolerable.

Emotions, hidden in the patient's subconscious, become perceptible as bruxism, biting of lips or tongue and speech disorder. Routine dental treatment will then not be advisable. Such patients should be recommended for psychiatric treatment which may favorably influence the mental disturbances caused by the "pathologic fear of the dentist and dental treatment."

Conversion hysteria manifested by anesthesia of the right face: report of a case

Peter F. Laband. *J. California D.A. & Nevada D. Soc.* 31:333-334 Sept.-Oct. 1955

Symptoms of hysteria in oral diagnosis take many different forms, from painful teeth and face pain to trismus, bad taste or anesthesia. An instance of conversion hysteria is reported. The patient, a 24 year old negro draftee, was referred for neuropsychiatric evaluation of his complaints of anesthesia of the right side of his face and neck, covering essentially the region supplied by the mandibular branch of the trigeminal nerve plus portions of the superficial cervical plexus. This anesthesia appeared after extraction of an impacted right mandibular third molar. Neurologic testing indicated conversion hysteria.

It was deduced that the subject's condition probably resulted from a combination of factors —his long-standing difficulty with his impacted tooth, fear of paralysis and cancer, his father's illness, and the extraction with its temporary anesthesia. It was suggested to the patient that his difficulty would disappear shortly and that he would be better off to join his fellows. The patient, when seen eight days after the first psychiatric consultation, reported that he felt better and that the numbness was disappearing.

In suspected instances of conversion hysteria, a thorough clinical examination is mandatory. If it does not lead to a comprehensive explanation of the symptoms and to a clear diagnosis, an underlying psychosomatic disturbance should be suspected and investigated in cooperation with a psychiatrist and neurologist.

Professional activities

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Education

The dilemma of undergraduate orthodontic education and its effect

Walter G. Spengeman. *Am.J. Orthodont.* 41:765-777 Oct. 1955

The development of undergraduate orthodontic teaching has been slow, but standards have been rising gradually over the past 30 years. Both the American Association of Dental Schools and the American Association of Orthodontists agree that the program of orthodontic teaching at the undergraduate level should be revised and expanded by the addition of approximately 300 hours of study. There are still some differences of opinion on how the present dental curricula can best be modified to accomplish the accepted objectives; but it is agreed that the underlying principles should be a streamlining of courses, the elimination of repetitious material, and an emphasis on those aspects which are basic to both dental and orthodontic education.

The trend today is for closer cooperation between the orthodontic and pedodontic departments of the dental schools.

Further clinical experience is mandatory if the undergraduate dental student is to be expected to accomplish even minor corrective procedures. Authorities agree that the addition of a minimum of 300 hours to the present orthodontic curricula would be required to achieve this goal.

A questionnaire was sent 1,015 general practitioners in New York State taken at random; 402 questionnaires (42.9 per cent) were returned. Insofar as the returns reflect the opinions of general dental practitioners, they indicate the following:

Dentists are aware of the deficiencies of their orthodontic education during dental school; 92.4 per cent of those replying said such training was inadequate, and 30.1 per cent reported they had taken a short course in orthodontics or pedodontics since graduation from dental school. To the question, If your local dental society . . . were to present a series of six lectures or clinics . . . , the purpose of which was a review on orthodontic recognition and a reminder of your responsibilities in the field of children's dentistry, would you attend? affirmative replies were received from 74.7 per cent.

Emphasis in such a series of clinics should be placed on recognition of the "normal" occlusion, the anticipation and detection of malocclusion, and the interception of malocclusion, where possible. The dental literature might well be augmented with more material concerning the growth and development of the head, face and neck, especially as related to studies in cephalometric roentgenography.

Manpower potentials

Howard A. Rusk. *Pub.Health Rep.* 70:784-785 Aug. 1955

Although the quality and availability of health services are rapidly expanding, the expansion has not kept up with the growth of population in the United States. Unmet demands for health workers exist in medical education, public health, mental and tuberculosis hospitals, and rehabilitation. Many rural areas and small towns are in need of practicing physicians. In dentistry a parallel problem exists. Training facilities are being expanded. This increase, however, is not keeping up with the population; it is estimated that by 1965 the ratio of dentists to population will be 57 per 100,000, as compared with 58 per 100,000 today.

Thus far, the attacks on the problems of curriculum, of faculty and of facilities for training health workers have been piecemeal and inadequate. A basic necessity is money. Medical and dental schools, schools of nursing and the paramedical sciences are all hampered by lack of adequate funds for the carrying out of their present programs, for the recruiting and maintaining of staffs, for the development of programs to meet changing needs, and for the provision of the best educational environment.

Contributions by medical undergraduates to the science of preventive medicine

William C. Gibson. *Pub. Health Rep.* 70:935-942 Oct. 1955

The inquiring, restless mind of the uninhibited undergraduate is the greatest asset in medicine and the greatest deterrent to smugness in research. The contributions of two dozen medical undergraduates of the past are reviewed. The determining factor often was the provision of facilities for a student investigator by a sympathetic teacher. Summer research scholarships in all fields of medicine and its ancillary sciences would repay educators handsomely. Student curiosity can be depended on to bring to light new facts of major importance, as it has in the past.

Edward Jenner, as a 19 year old medical apprentice, noted the comment of a milkmaid that she had had cowpox and therefore could not get smallpox; it laid the basis for his eventual advocacy of vaccination. René Theophile Hyacinthe Laennec, as a medical student, discovered the subdeltoid bursa, showed that hydatid cysts were caused by parasites, and showed "phthisis" to be tuberculosis of the lungs. James Jackson, Jr., was the student discoverer of the prolonged expiration in pulmonary tuberculosis. While a student, James Blake, another American pioneer, arranged the elements into a periodic table on the basis of their physiologic effects. Rudolf Virchow as an undergraduate in Berlin tested the prevailing theory that inflammation was vascular in origin by studying it in the cornea, a nonvascular tissue. James Paget as an undergraduate in London discovered the cysts of *Trichinella spiralis* in the muscles of a cadaver he was dissecting. In 1870, William Osler, a first year medical student at the University of Toronto, was removing these trichinae from a cadaver and trying to infect cats, dogs and rabbits with them. Daniel Carrion, probably the only medical student in history to have a medical school and several hospitals named after him, demonstrated, at the cost of his life, the connection between Oroya fever and verruga peruana. William George MacCallum in his final year as a student at Johns Hopkins Medical School, reported on his studies of malarial parasites in birds, supplying the missing link in the life cycle of the parasite. The father of modern chemotherapy, Paul Ehrlich, stated his great side-chain theory as a medical student. The first aniline dye was synthetized by an 18 year old English chemistry student, William Henry Perkin. Archibald Scott Couper, as a student in Paris, proposed a valency of four for carbon and showed that it formed long-chain compounds. John Shaw Billings, while writing a student essay on the surgical treatment of epilepsy, came to realize the lack of any index to the world's medical literature; he lived to remedy this through the Index Catalogue. Thomas Young discovered in his first days at medical school that the lens of the eye varies its shape in accommodation. Frederick Gowland Hopkins, before graduation in medicine, published a paper on the pigments in the wings of the English brimstone butterfly, found the pigment to be a derivative of uric acid, and immediately improved the method for the determination of uric acid. Paul Langerhans discovered the "islets" in the pancreas two years before he graduated in medicine. The deposition of calcium in the teeth and bones of the body was poorly understood until in 1877 the Swedish medical student, Ivar Sandstrom, discovered the parathyroid glands. His paper was so thorough that little has been added to the subject since. Jean L. M. Poiseuille in his M.D. thesis in Paris described his mercury manometer for registering blood pressure. Alphonse Gal, while a medical student in Italy, was the first to describe the itching which goes with "the bends" in deep sea divers.

The training of the undergraduate dental student

J. L. Hardwick. *Brit. D.J.* 99:139-142 Sept. 6, 1955

In the last 30 years a major evolution in the financial responsibility for training undergraduate dental students has occurred in Britain. The gradual expansion in teaching facilities has increased the cost of a dental education to between £1,500 and £2,000 ($4,200 and $5,600) for each student, apart from his maintenance during his period of training. During the four and a half years generally required before a dental student

obtains his basic qualification, public funds will have subsidized that student to the extent of between £1,000 and £1,500. The community has become largely responsible for providing the funds for training dentists. This evolution has not been generally realized because it has occurred almost insidiously and because few schools have increased their fees greatly during the last 30 years.

In the United States, grants from public funds to assist dental education are small; many students support themselves during their training by taking part-time employment. Swedish dental schools receive direct grants from the state, and the fees paid for the teaching itself are negligible; in addition, students may receive grants in the form of loans which are canceled by subsequent periods of service in the public dental service.

The increased financial assistance from public funds has widened the field from which dental students are drawn in Britain. The expectation that this would result in an increase in the number of applicants for training as dentists has not materialized. Most British dental schools are not filled to capacity. In the United States, Sweden and Norway the ratio of practicing dentists to population is nearly twice as high as in Britain. In the United States, Denmark and Sweden there are between two and three suitable applicants for every available place in the dental schools; in Norway there are ten applicants for each place. Yet the financial remuneration of dentists after qualification is lower in two of these countries than in Britain. Private practice outside the national health service is undertaken by a greater proportion of dentists in Scandinavia than in Britain; possibly the British National Health Service, which tends to discourage, although it does not prohibit, more advanced and expensive technical procedures, may lessen the attraction of dentistry as a profession.

The most outstanding difference is in the status of dentistry. In the three Scandinavian countries the dental schools are autonomous bodies working in close liaison with medicine and other sciences; their primary functions are the training of dental students and research; treatment is provided for patients only insofar as it subserves these objects. The public regards dentistry as an intellectual discipline whose members should be of the highest intellectual caliber. The emphasis placed on dental research enhances this conception. The state provides liberal funds to the dental schools for research.

In Britain dentistry is still regarded by most lay people as a profession in which manual skill, or even strength, is paramount and in which knowledge and intellect play a minor part. It is often assumed that dentistry is not a profession suitable for women because they lack the necessary physical strength. The facilities and accommodation in most dental schools are inadequate. Undue importance is attached to treating the mass of the public in dental hospitals; dental research is not regarded as one of their primary functions. The community could help raise the standard of dentistry by providing funds to bring the accommodation and equipment in dental schools up to modern standards. Fundamentally, the raising of the status of dentistry is dependent on the demonstration by each member of the profession in his conduct and practice of what dentistry can be.

▼ History

Early Florida dentistry

C. D. Driscoll. *J. Am. Col. Den.* 22:167-173 Sept. 1955

This paper, one of seven presented at the third annual meeting of the American Academy of the History of Dentistry held in 1954 in Miami, describes the experiences of the author and his father, the late W. E. Driscoll, in the practice of dentistry. W. E. Driscoll had moved to Florida in 1881 from Indiana, for reasons of health. He traveled to his patients in Florida with a "light Florida wagon" and mule. The itinerary of his route is as follows: "We worked Manatee, Bradenton, Palma Sola, Ellenton, Parrish, Tampa, St. Petersburg, Lakeland, Ft. Meade, Bowling Green, Wauchula, Zolfo Springs, Arcadia, Nocatee, Ft. Ogden, Cleveland, Punta Gorda, Charlotte Harbor, Ft. Myers, Punta Rassa, Sanibel Island, St. James City, Naples, Marco, Ever-

glades, Chokoloskee, Pine Level, Miakka and Sarasota." Some of this territory had to be reached by boat, the rest by mule and wagon over backwood trails.

The author, who became a dentist when he was 19 with a diploma from Indiana College, recalls his own experiences as an itinerant dentist, fording alligator-infested streams, traveling around the coast by schooner, treating Seminole Indian patients and so forth. The Driscolls worked under many hardships, using hand drills. They had no right angle hand pieces or other such instruments.

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Interprofessional relations

The physician and dental and jaw injuries

Leonard S. Morvay. *Indust.Med.&Surg.* 24:307-308 July 1955

An increasing number of industries, and the physicians responsible for industrial medical programs, are becoming aware of the value of a well-organized dental program. The average industrial physician rarely can make even a reasonably accurate determination of the degree of jaw disability after the completed treatment for a jaw fracture. The dentist is better equipped to render dental first aid than is the physician; but, if a dentist is not immediately available, the physician should be familiar with emergency procedures for industrial dental accidents.

Principles of responsibility governing industrial dental practice are outlined, and respective duties of dentist and physician defined. First aid measures for fractures of the jaw and for trauma to the teeth, which the physician can perform, are discussed. Application of a four-tailed bandage in emergency treatment for jaw fracture is recommended. The dentist should be brought into the picture as soon as possible. When trauma to the teeth and surrounding tissues occurs, efforts should be made to preserve the involved teeth, even though they are extremely mobile. Loose teeth can be immobilized by interdental wiring and splinting. Even completely dislodged teeth, when recovered, sterilized and replaced in their sockets, become solidly attached to the alveolus in many instances. The sooner such teeth are replaced, the more favorable the prognosis.

Directions for use on prescriptions

(Vermerk einer Gebrauchsanweisung auf dem Rezept)

K. F. Hoffmann. *Deut. zahnärztl. Ztschr.* 10:1262-1266 Sept. 15, 1955

The carefully worded direction for use is an essential part of the prescription which also should contain the patient's name, address and age. Oral instructions should be confirmed, and statements such as "use as directed" avoided. In the United States, the pharmacist keeps the prescription in his files; in many European countries, it is customary to return it to the patient after dispensing the prescribed drug.

Writing the direction for use assures the patient of the benefit of the exact dosage of the drug (or combination of drugs) which should be most effective in the treatment of his disease. It enables him to observe to the letter the instruction noted either on the prescription or copied by the pharmacist on the label of the box or bottle containing the prescribed medicament.

Many drugs which are considered habit forming or too dangerous for use without any professional supervision should not be dispensed by the pharmacist without the special instruction by the dentist. The labels of such pharmaceutical products must bear the statement: "Caution: dispensing without prescription is prohibited by law." These prescriptions cannot be refilled except by renewed authorization by the prescribing dentist. The dentist's registry number must always be added when a narcotic is prescribed. In instances in which the drugs will be administered personally by the dentist to the patient during treatment, the direction for use can be omitted but the prescription then should bear the statement: "To be delivered to the dentist only."

Preparations of secret or semisecret formulas should be avoided. Obviously, the prescribed preparation should always conform to the principles of therapeutic and pharmaceutical ethics.

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Dentistry in government

Medical and dental officer career incentive program

Ralph L. Christy. *U.S.Armed Forces Med.J.* 6:1469-1475 Oct. 1955

The provision of adequate medical and dental care for the three armed services is being threatened by the shortages and losses of career medical and dental officers. The problem was assigned by the Secretary of Defense to the Task Force on Career Incentives. The Task Force has explored the problem. It determined that career military medical officers were needed for the following reasons:

1. A third of the 2,850,000 military personnel are overseas or on the seas, and require uniformed medical personnel to provide medical care and to ensure healthy fighting men for combat readiness.
2. The 2,000 medical facilities or units throughout the world each require one or more military physicians.
3. Many specialties, such as aviation, submarine and atomic medicine, medical logistics, and readiness planning are, for the most part, peculiar to military medicine.
4. Medical care for large numbers of dependents must, of necessity, be furnished by military medical officers overseas, as well as at isolated bases in the continental United States.

In the past three years two regular officers have been lost for every replacement. A turnover of nearly 45,000 medical and dental officers entering and leaving the services in these three years, to fulfill a mission requirement of some 16,000, has superimposed a problem of training and retraining, processing, security checks, loss of time in extra travel, and so forth, that is expensive and wasteful of manpower.

The prestige of a military medical career has deteriorated in recent years, particularly in regard to rank, because the medical or dental officer generally is several years older than most other officers of his grade. The necessary compulsory aspects of the doctor draft law has contributed to the lowered prestige of a military medical career. The overwhelming factor in the failure to choose a military career has been the inadequate financial return, in relation to the years of education and training and in comparison with civilian opportunities.

Acting on the recommendations of the Task Force, the Secretary of Defense has directed the three service secretaries to improve the attractiveness of a military career for physicians and dentists by improved assignment and 20 year guaranteed retirement policies; by revision of promotion policies; by encouragement of attendance at professional meetings, and by provision of five years' constructive service for promotion purposes (instead of four years) for medical officers, and four years (instead of three) for dental officers, in recognition of their additional years of professional education. Proposed legislation would also provide for additional monthly pay up to $150 for agreements to serve for periods of from three to nine years. Should the entire proposed program be adopted, a young doctor would enter the service after completion of internship in the grade of captain (in the Army or Air Force) or of lieutenant (in the Navy) at a starting salary of about $775 a month. It is hoped that enactment of the proposed legislation will make possible an increase in the number of career reserve or regular medical and dental officers to about two thirds of the requirements instead of the present less than one third, and thus provide adequate stability.

A.D.A. research fellowship: a current review of the program

George C. Paffenbarger. *Illinois D.J.* 24:455-458 July 1955

There are ten American Dental Association research associates at the National Bureau of Standards, Washington, D. C., and the fellowship budget for 1955 is almost $77,000. The initial work of the fellowship was almost solely the formulation of standards for dental materials and the testing of these materials for compliance with such standards. The program of the Association's Council on Dental Research as it pertains to the formulation of specifications and the certification of dental materials for compliance with these specifications is under the direction of John Stanford, a chemist. The Association now has 12

specifications for dental materials, which are revised as improvements are made in the materials or as new data and materials become available.

Other fellowship functions are the laboratory testing and evaluation of new types of materials for use in dental health service, and basic research on the hard tooth tissues with the purpose of developing their ultimate structure. The fluorescence of teeth is being studied. A hydraulic-turbine dental handpiece which attains a speed of 61,000 rpm has been developed in the Bureau. This promises to make possible more efficient cutting of tooth structures, a reduction in time spent by the patient in the dental chair, and to be of use in other fields where small amounts of hard materials must be removed by grinding. To assist in correcting conditions leading to injuries by roentgen ray radiation, the Council on Dental Research has cooperatively produced a motion picture with the Bureau to show dentists the hazards which lurk wherever roentgenograms are used.

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Forensic dentistry

Criminology and dentistry (Kriminalistik und Zahnheilkunde)

H. Euler. *Zahnärztl.Reform* 56:275 July 1955

Dentistry often plays a major role in criminal investigations, not only in the identification of corpses but also in connection with accidents and crimes. Sometimes, with the aid of dentists, facts can be established which otherwise would not be obtainable. An evaluation of the development of the jaws and teeth makes an estimate of age possible. Even if the approximate calculation of the age of a subject is based more or less on incomplete data or on guesswork, clues for age determination may be obtained from the eruption of teeth, changes occurring in dental tissues, attrition of the enamel, sclerosis of dentin, denticles in the pulp, deposition of cementum, and alterations in periodontal structures.

The subject's oral characteristics such as inherited and acquired malformations, technics applied in construction of prostheses, signs of a specific dental treatment, and the complete dental chart can be made known publicly, and in this way can be brought to the attention of relatives or the dentist who had treated the subject. In this manner correct identification often can be established.

When corpses have undergone changes so extensive that external characteristics cannot offer any information, usually after conflagration, the teeth often are the only means of identification. In criminal literature, many instances were reported in which isolated teeth furnished the only clue for establishing the identity of either victim or criminal.

In dental investigations as an aid in the search for missing persons, speed often is of great importance. If the correct identification cannot be made by customary methods, observations by means of the microscope may furnish the necessary clues. The advantage of microscopy is that this method will enable study by reflected light even during the primary grinding process.

Living persons often can be identified by dental investigation. Hereditary marks may establish the subject's parentage and kinship, essential in the identification of amnesia victims. Wounds caused by bites frequently identify the perpetrator of crimes. With the aid of dentistry, the time and manner of death often can be determined.

An adequate training in criminal dental investigation, and an awakening of the profession to an understanding of how important it is to cooperate with the authorities in their investigations, certainly will extend the part dentistry plays in criminology.

Armamentarium and instrumentarium

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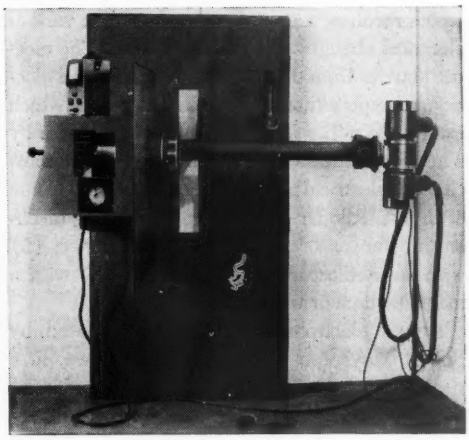
Equipment

The application of cinefluorography with image intensification in the field of plastic surgery, dentistry and speech

Herbert K. Cooper and F. Allan Hofmann.
Plast. & Reconstruct.Surg. 16:135-137 Aug. 1955

The introduction of cinefluorography with the Phillips image amplifying tube in lieu of the fluoroscopic screen is employed by the Lancaster, Pa., Cleft Palate Clinic in its study of cleft palate, temporomandibular joint, facial deformities, and the muscles of speech. The image amplifying tube is basically an image converter so constructed that information gathered from the roentgen ray radiation passing through the patient is resolved by this tube to an exceptional degree and simultaneously intensified to a brightness level that is approximately 1,000 times greater than that provided by the ordinary fluoroscopic screen. The drastic reduction of radiation hazard to the patient is the greatest reward. Using this new custom-designed equipment, the authors have, within one hour, exposed, developed and projected a 100 foot length of 16 mm. cinefluorographic motion picture film containing a wealth of information not available by ordinary procedures. The cinefluorograph consists of the following components: a roentgen ray control with stepless regulation of both kilovolt (penetration) and milliampere (density), a full wave roentgen ray generator, and a stand which on one end of its horizontal arm supports the image intensifier 16 mm. motor driven camera assembly. The rotating anode roentgen ray tube is at the opposite end of the arm. The patient is placed in the sitting position between the roentgen ray tube and the image intensifier, while the horizontal arm is adjusted to accommodate the individual. The operator need depress only two pushbuttons to operate the cinefluorograph. While the roentgen ray movies are being made, sound is recorded on a magnetic tape machine. A 100 foot roll of 16 mm. movie film exposed in the cinefluorograph provides approximately 3,984 separate pictures for study.

In reviewing the information, it is possible to observe the projected film at either 16 or 24 frames a second, or the projector may be stopped so as to examine each picture. In this manner the operator can visualize the normal, the short, and the cleft palate in motion. Prosthetic speech aids



The cinefluorograph consists of a roentgen ray control, a full wave roentgen ray generator and a stand which on one end of its horizontal arm supports the camera assembly, on the other end the rotating anode roentgen ray tube

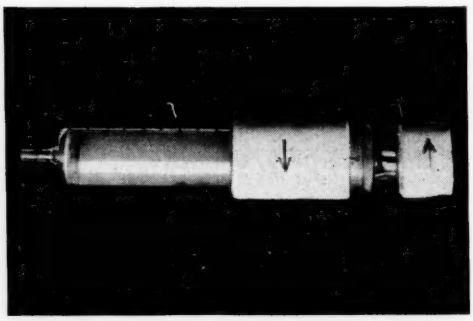
are examined for placement, function and conformation to the surrounding areas. Tongue and throat movement is recorded during swallowing, normal and abnormal speech. The organs of speech are analyzed and compared. The cineflourograph reveals both the bone structure and the soft tissue. No contrast medium has ever been necessary in the visualization of the soft tissue areas so important in plastic surgery.

A simple technic for freeing "frozen" syringes

Sidney Greenberger. *Med.Tech. Bul.* 6:226-227 Sept.-Oct. 1955

A technic for freeing frozen syringes with minimum effort and cost relies on the principle of concentrating a maximum amount of energy in opposing torques at the junction where the components of the syringe are frozen.

Two half inch wide strips of adhesive tape, 12 inches long, are cut. One strip is wound clockwise about the head of the plunger and the second strip is wound counterclockwise about the head of the barrel. The tape around the plunger is grasped with the right hand, the tape around the barrel, with the left hand. As clockwise stress is exerted with the right hand, counterclockwise stress is exerted with the left hand. When the point of freezing is separated, the plunger is removed from the barrel.



Implications of myographic research

Harold T. Perry, Jr.
Angle Orthodont. 25:179-188 Oct. 1955

Use of the electromyograph in dental research is described. The electromyograph is a machine which receives, amplifies and records the various electrical changes occurring in muscle. The electric activity from the muscle is carried to the electromyograph either by a surface electrode which is attached to the skin overlying the muscle, or by a needle electrode inserted directly into the muscle. The electrical activity may be recorded in one of three methods: (1) with an ink-writing mechanism, similar to an ink-writing barometer; (2) with an oscilloscope and camera, or (3) with a magnetic tape or wire recorder.

Dental electromyography was originated by Robert Moyers at the University of Iowa, in a study of the muscles of the temporomandibular joint. In 1952 a series of electromyograph researches was begun at the Northwestern University Dental School. Geltzer studied the reliability of day-to-day recordings from the same muscle. Swemer and Perry studied the temporal and masseter muscles, the findings pointing to the dominant role of the temporal muscles in the initiation of mandibular movements. It appears that there is a definite functional pattern illustrated in the neuromuscular system for each class of malocclusion. Studies to determine the rest position of the mandible with the aid of the electromyograph are being pursued, with encouraging results. Other subjects under study electromyographically include temporomandibular joint dysfunction, a serial study of poliomyelitis patients with involvement of the muscles of mastication, recordings of habit patterns before and after correction, of muscle patterns before and after condylectomies, and of mandibular resections and hemisections.

The electromyograph affords a new means of tapping a vast source of information. Its sole dental use today is in basic research.

A new type of intraoral vibrator
(En Ny Typ Av Intra-Oral Vibrator)

Sam Karlström. *Odont. Tskr.* 63:326-337 Aug. 1955

In connection with work on electronic vibrators constructed by the author for condensation of amalgam dies, a mechanical type of vibrator also was developed which has proved effective for condensation of amalgam fillings in the mouth.

The Inka intraoral vibrator is based on the rotation of a ball inside a cylinder of larger diameter. The ball is attached by a springy metal wire to the rotating shaft of the handpiece, so that, when the head of the instrument is put under load, the ball goes into an excentric position and causes vibration. The most suitable frequency was found to be 20 vibrations per rotation with an engine speed of 70 revolutions per second (1,400 vibrations per second). At this rate of vibration the instrument emits a soft hum that causes the patient no discomfort while the efficiency of vibration is satisfactory.

Various condenser points have been constructed. They are secured to the vibrator by spring force and are easy to change. The vibrator is not damped when pressure is exerted, but the effect is quite independent of the pressure applied, so that a good effect may be obtained without pressure. This property of the vibrator makes it possible to use it for condensation of amalgam dies in hydrocolloid impressions.—*G. Ryge*

▼ Materials

Molding and staining acrylic resin anterior teeth

Eugene J. Tillman. *J.Pros.Dent.* 5:497-507 July 1955

To take advantage of the superior esthetic qualities of acrylic resin teeth, the dentist must follow an orderly procedure in reproducing the shadings and blending of colors in natural teeth. A practical staining kit consists of a metal file box, eight 1 oz. toy nursing bottles (each labeled to show the color of stain it contains), mixing jar, bottle of monomer, scalpel and a monomer syringe. Acrylic resin of tooth body shade is mixed, brought to a rubbery consistency, and pressed in a metal mold for six anterior teeth. When the mold is removed from the press, it is opened and the teeth are carved to avoid regularity and duplication. Incisal and cervical shades are added and consolidated. The mold is closed and boiled for one minute to bring the teeth to a leathery consistency. Check lines, silicate restorations and opaque spots are added, to further simulate a natural appearance. The mold is then bench-cured under pressure for 30 minutes, boiled for 30 minutes, chilled under cold running water and opened. The flash resulting from excess resin is buffed off, and the teeth are finished and ready for use. The dentist, by selecting and distributing stains carefully, can make anterior teeth which harmonize with the patient's physiognomy.

The value of centrifugation in the preparation of dental stone dies
(Centrifugeringens m. m. betydelse för ythårdheten hos preparationsmodeller av hårdgips)

Stig. G:Son Östlund. *Odont. Revy.* 6:183-194 June 1955

The indirect technic depends on the exactness of the dies used, and on their resistance to deformation during the fabrication of the appliance. In order to resist the effect of carving instruments along the limits of the preparation, the surface hardness should be reasonably high.

Amalgam has been used extensively for dies, but this material is not suitable for use with hydrocolloids or rubber base impression materials, and the need for stone models with high surface hardness has increased.

In this study the effect of centrifugation of stone dies as well as vacuum mixing was studied, as was the effect of the clinical treatment of the dies by immersion for several hours in paraffin oil, microfilm and 2 per cent borax solution. Since by centrifugation the stone is injected into the impression in a rather fine stream, it was decided to study whether this method in itself gave rise to

dies with less air porosity on the surface or inside the die.

The materials used were Duroc, Diolite, Vel-Mix and Fren Roch. A steel die was made in the form of a diagrammatic full crown shoulder preparation, and impressions were made in Kerr's impression compound (red sticks).

Standard dies for comparison were made using carefully hand mixed stone (5 ml. H_2O, R.T., 20 Gm. stone). The stone was added in small portions along the side of the impression. Other dies were made similarly from stone mixed mechanically under 28 inches of vacuum.

Centrifugation was carried out by placing the impression in a rotating holder attached to a dental lathe rotating at 3,000 rpm. The stone was fed into the impression from a plastic capsule through a 1 mm. opening. Both hand mixed and vacuum mixed stone were used, and the centrifugation time was varied from 15 seconds to 10 minutes. Centrifugation resulted in 80 per cent higher surface hardness (Brinell hardness number 27.1) than did vibration.

Mechanical mixing under vacuum in connection with centrifugation further increased the surface hardness to Brinell hardness number 35.8.

Treatment of the dies with paraffin oil resulted in a slight decrease in hardness. Treatment with aqueous solution (microfilm and borax solution) decreased the hardness. Centrifugation caused a noticeable increase in the number of air bubbles, both on the surface and inside the die.—*G. Ryge*

Polyvinylidene chloride film as an aid in office asepsis

Alvin Meyer. *J. California D.A. & Nevada D. Soc.* 31:338-340 Sept.-Oct. 1955

The maintenance of instrument sterility between autoclave and mouth is a demanding task. A technic is described in which polyvinylidene chloride film is used to protect the instruments after autoclaving. This film is transparent. It is somewhat cohesive at room temperatures so that no binding or taping is necessary; at autoclave temperatures the film's cohesion is exaggerated to seal the package more tightly. As compared to paper, the film seems much stronger and exposes the entire instrument to examination. No labels are necessary, and right and left hand instruments are distinguished easily. No special cabinet is required to store instruments wrapped in polyvinylidene chloride film.

A test to determine the film's ability to maintain sterility was made. No bacterial growth was demonstrable. The test was macroscopic and inadequate. Further tests with identified spore formers and pathogens would be of interest.

▼ Therapeutics

Therapy of postoperative hemorrhage in the jaw region with hemostypticum tachostypan (Die Behandlung von Nachblutungen nach chirurgischen Eingriffen im Kieferbereich mit dem Haemostypticum Tachostypan)

W. Gerstmann. *Zahnärztl.Rundschau* 64:371-372 June 20, 1955

The immediate cessation of hemorrhage after trauma or surgery is important. Serious conditions may result it certain functions within the body are inactivated during the blood coagulation. Blood plasma, tissues and thrombocytes contain a certain substance necessary for blood coagulation. This substance, thrombokinase, exists only in an inactive, combined form. When the inactive thrombokinase meets the injured tissues, an activating conversion is achieved by contact catalysis. The thrombokinase, along with calcium salts, acts on the prothrombin of the blood, converting it into thrombin which then changes the inactive, liquid fibrinogen into fibrin. Fibrinogenetic fibers contact and squeeze out the blood serum (retraction of the coagulum). Proteolytic enzymes form blood clots (fibrinolysis). This chain reaction is a prerequisite for the blood coagulation. Failures in the coagulative process prevent correct coagulation and lead to renewed hemorrhage. Schoch's hemostypticum tachostypan is obtained from the brains of cattle and activates the thrombokinase. E. Deutsch proved by animal experiments and by

chemical analysis that this drug is free of albumin or any antigenic substances, and that no anaphylactic shock can be caused when hemostypticum tachostypan is locally applied in treatment of hemorrhage. In 27 patients, the postoperative hemorrhage was stopped immediately, and no patient suffered undesirable after-effects.

For dental practice, this preparation is an excellent expedient in the control of postoperative bleeding. The effectiveness of this drug lasts for about four hours; therefore, from one to three additional injections will be necessary.

An investigation into the efficiency of benzalkonium chloride in isopropyl alcohol as a tooth surface sterilising agent

G. E. Ray. *Brit. D.J.* 99:263-266
Oct. 18, 1955

An investigation is reported into the usefulness of benzalkonium chloride in isopropyl alcohol as an antibacterial agent for application to the tooth surface. Twenty-five volunteers were employed in the series of seven experiments. In each experiment a rubber dam was applied to the anterior teeth. Similar teeth in either quadrant were selected, and sterile paper points soaked in nutrient broth were rubbed on the tooth surfaces and then placed in tubes of nutrient broth and incubated aerobically. The selected teeth and surrounding rubber dam were then swabbed with cotton-wool rolls soaked, either in the reagent under test, or in the control solution (normal saline) for 30 seconds. After two minutes fresh paper points soaked in nutrient broth were rubbed on the tooth surfaces and then placed in tubes of nutrient broth and incubated aerobically. This was repeated after a lapse of a further three minutes and then at five minute intervals over a period of 20 minutes. The tubes of broth were incubated at 37° C., and turbidity was taken as evidence of growth.

In the first five experiments intact tooth surfaces only were chosen. In the sixth experiment the surfaces selected were those through which access to the canals would be obtained normally and in which the continuity of the surface had been broken by the placing of a restoration. The last experiment was a carry-over test to determine whether any minute amounts of the drug carried over into the broth might inhibit the growth of bacteria not killed on the tooth.

Assuming the experiments represented the larger population likely to require endodontic treatment, the following statements are probably true:

1. If 2 per cent benzalkonium in 50 per cent isopropyl alcohol is applied as described to the isolated tooth surface and left for two minutes, there is a probability of the surface being rendered sterile in rather more than 94 per cent of the instances.

2. The tooth surface will remain sterile for 20 minutes, though this is more likely to be because of absence of contamination rather than because of persistence of the drug.

3. Concentrated chloroxylenol compares favorably in efficiency with 2 per cent benzalkonium in 50 per cent isopropyl alcohol. Both reagents appear to be more effective than 2 per cent iodine tincture U.S.P. under the conditions of these experiments.

Chewing gum, penicillin and oral flora
(Kaugummi, Penicillin und Mundflora)

W. Nikolowski. (*Med.Klin.* 2:93 1955)
Zahnärztl. Rundschau 64:408 Aug. 5, 1955

A group of 50 patients, who were being given treatment for different forms of dermatosis, received chewing tablets containing penicillin after breakfast. Each tablet consisted of a base of chewing gum and 4,500 IE penicillin. The tablets had to be chewed for at least four hours. Every hour one additional tablet was dispensed. In approximately two thirds of the group, a decrease or a certain fluctuation in the oral flora was observed. In more than half of the instances, however, a strong increase of *Candida albicans* was noticed. The health condition of each individual unquestionably influenced the extent of the development of these fungi. This rapid increase or new formation of *Candida albicans* in the oral cavity was clearly established to have taken place during the masticatory movement. After a short time extensive eczematous symptoms were visible. This experiment should be followed up by further bacteriologic research.

Preventive and public health dentistry

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Public health dentistry

Coordinate and subordinate research in South Africa
(Koordinierte and subordinierte wissenschaftliche Forschung in Südafrika)

E. S. Priester, Johannesburg. *Zahnärztl.Mitt.* 43:546-548 Aug. 1, 1955

South Africa still is in one of the first stages of development, especially in regard to education and science. The government recently created the South African Council for Scientific and Industrial Research, which maintains its own modern laboratories, and has established research centers in all South African universities and colleges. An interchange of thoughts and findings is carried out between the South African Council and similar governmental agencies in the British, Belgian, French and Portuguese territories in Africa.

The newly created Department of Dentistry is the Council's tenth subdivision, and it is affiliated to and located at the University of Johannesburg. J. T. Irving is both director of the governmental department and professor of experimental odontology.

The Department of Dentistry is occupied mainly with specific South African dental problems, such as: examination of tooth development in school children; synthesis of protein in dentin and enamel; studies on amelogenesis; influence of nutrition on tooth formation and bone structure; biochemistry and the enzymic system of pulp and enamel organs (using histochemical and microchemical methods); tooth development in different species of South African apes; biochemistry and histochemistry of epithelial cells and salivary glands. An intensive bacteriologic research will be added shortly.

Professor Irving's assistants are engaged independently in several other studies, such as: South African health conditions in regard to dentistry; dental caries in baboons; disturbances in temporomandibular articulation and malocclusions; tumors occurring in the oral cavity; salivary glands and carbohydrate metabolism, and bacteriology and biochemistry of caries. The results of these studies will be published quarterly.

Another subdivision of the South African Council for Scientific and Industrial Research, the National Nutrition Institute, examines and evaluates nutritious materials, and according to its findings advises the food industry to enrich food with vitamins and other chemical and organic substances. The products and the results achieved will be analyzed by the Department of Dentistry.

Annual report of Toronto's dental health services for the year 1954

F. H. Compton. *J. Ontario D.A.* 32:245-249 Oct. 1955

The Division of Dental Services in Toronto has the following objectives: (1) development and promotion of methods for the prevention of dental disease and dentofacial deformities; (2) early detection and control of such conditions when they are not prevented, and (3) development of attitudes that will motivate the dental profession to practice, responsible officials to sponsor, and the public to accept these preventive and control measures. The Division has 78 staff members: the director, a clerk, seven full-time dental officers, 29 part-time dental officers, one full-time orthodontist, one full-time orthodontic technician, one full-time x-ray technician-dental assistant, seven full-time dental assistants and 30 part-time dental assistants.

Close liaison is maintained with the Academy of Dentistry, the Faculty of Dentistry of the University of Toronto, the dental public health committee of the Ontario Dental Association, the Dental Health Officers' Group of South-Central Ontario, and with the divisions of medical statistics and dental services of the Ontario Health Department.

In 1954, 84,304 children were either screened or examined, accounting for 88 per cent of the total school population. This is the largest number of children examined in any one year in To-

ronto. Of the total, 38,407 children were screened for notifiable dental defects, and a further 45,897 children were given a more searching quantitative examination. The principal findings are summarized in tables.

A Public Health Preventive Orthodontia Clinic was established in 1950 through a federal health grant and is now in its fifth year of operation; 1,173 patients have attended.

Under its dental care program for persons receiving tuberculosis after-care assistance, the division gave dental care amounting to $1,749 to 29 patients.

The Department of Public Health and the Local Board of Health again endorsed the adjustment of the fluoride content of the Toronto water supply as a partial caries control measure.

The selection of the orthodontic patient

Rachel Sclare.
British D.J. 99:194-198 Sept. 20, 1955

Although the incidence of malocclusion in England is about 30 per cent, until the introduction of the National Health Service in 1948 orthodontics was regarded mainly as a luxury service. Under the National Health Service, orthodontic treatment can be obtained free of charge for all children and adolescents, and there is a great demand for such treatment. Inasmuch as the number of dentists practicing orthodontics is limited, it is inevitable that the number of children who can be treated also will be limited. If the orthodontist is to fulfill his obligation to society, this selection will have to be done systematically.

Health, according to the World Health Organization definition, is a state of complete physical, mental and social well-being, and not merely the absence of disease and infirmity. Any condition which handicaps the individual in his efforts to adjust himself to his environment is inconsistent with good health.

The face is probably the most conspicuous and significant part of an individual. It is the first thing which is noticed. Although it is not necessary to be good looking and have perfect features, it is important that one's face should be such that he does not need to feel self-conscious about it. When this is not possible because of some oral deformity or facial disharmony, the health and happiness of the individual may be impaired.

The child whose personality is being affected adversely by his dental anomaly is entitled to all the benefits which can be provided by orthodontic treatment, regardless of whether the malocclusion be great or small, so long as it is a source of worry to him. Children with gross malocclusions and irregularities of the teeth, especially where these are causing functional impairment or are liable to increase caries susceptibility, should be given the opportunity of having treatment even when it has not been requested. The oral deformity which presents a great handicap is that caused by congenital clefts of the lips and palate, for these not only detract from the appearance but affect the speech. Rehabilitation of the cleft palate patient involves a team of workers which includes surgeon, pediatrician, orthodontist, prosthetist and speech therapist.

Although dental irregularities are not the cause of defective speech, they are not infrequently found in combination with such a condition. Cooperation between speech therapist and orthodontist leads to a considerable reduction in time and effort in curing a speech defect and, unless the malocclusion is corrected, the rehabilitation of the patient will be incomplete.

There are a number of instances of irregularities of the teeth which are referred or selected for orthodontic treatment solely for cosmetic reasons. It is important to remember that it is not just the dentition but the whole patient who must be considered and that the requirements of individuals are by no means the same.

The waiting lists for orthodontic treatment could be diminished considerably if the general practitioner were sufficiently aware of the normal growth pattern of the jaws and dentition to be able to distinguish the changes that occur during growth and development from actual anomalies. The practitioner should also be able to recognize and respect the limitations imposed by nature and circumstances. There seems to be little justification for orthodontic treatment in a child with rampant caries who is likely to have to wear a denture by the time he or she is 20 years old. The malocclusion in a badly nourished child, or in one who is otherwise physically or mentally handicapped may be improved by orthodontic treat-

ment, but it may not be right to impose an additional burden on these children.

Ideally, every child should be given as perfect a dentition as is possible within the limitations of that child, his dental arches and his basal bone, but until this is possible, energies and skill should be devoted to an immediate service for children with dentofacial deformities which are interfering with their well-being.

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Caries etiology and control

Fluoridation and vituperation

Editorial. *Am. J. Pub. Health* 45:1356-1357 Oct. 1955

In April 1955 the controlled study of fluoridation of the public water supply in Newburgh, N.Y., completed its tenth year, providing an opportunity for a stocktaking of the effects of fluoridation upon the young and adult population of Newburgh, in comparison with that of Kingston, N.Y., the control observation center. The comparative results, briefly, are as follows:

1. Water fluoridation has no demonstrable systemic or developmental effect on children, except for significant reductions in tooth decay.

2. The children examined in Newburgh show normal blood hemoglobin values and urine analyses. Many of the children have been drinking fluoridated waters all their lives.

3. Over a 15 year period the infant mortality in both cities has shown a comparably continuing downward trend.

4. The number of decayed, missing and filled permanent teeth in the children of from six to ten years old is 60 per cent lower among the entire Newburgh group of children than among the Kingston children.

5. The decayed, missing and filled permanent teeth among Newburgh children six and seven years old, who have consumed fluoridated water all their lives, is 75 and 68 per cent lower than those for comparable Kingston children.

The study represents one of the finest demonstrations of cooperative effort between the citizens and public and private agencies that this country has seen. The foresight and care with which the study was designed and executed are to be commended. Today nearly 800 communities in the United States serving some 20,000,000 people are using fluoridated public water supplies, again with no evidence whatsoever of anything but favorable results.

How, then, does one account for the electrically charged attacks on this public health effort? The settlement of scientific issues by vituperation, in legislative debate, and in the courtroom is not a new phenomenon. The uses of alum and chlorine in water treatment went through the same baptisms of fire half a century ago. It is not novel for accredited scientists to mix fact and fancy, near truth with truth, and emotion in a brew calculated to confuse rather than to clarify the minds of the public. In the battle for and against fluoridation, the best and the worst of scientific debate are exemplified.

Observations on dental caries and eruption of teeth among children born during the occupation of Greece (1941 and 1942)

J. Zoukos. *Odontostomat. Progress* 9:81-96 June 1955

This study included 1,378 boys and girls born during the occupation of Greece in World War II. Of these, 663 were born in 1941 and the remainder in 1942. The study was carried out to determine whether the privations which pregnant women underwent during the first years of the occupation had any effect on the development, calcification, and incidence of dental caries of their children's teeth.

Of the children examined, 592 were born and had lived in the poorest section of Athens, where deprivation was at its peak; 540 children were born and had lived in the agricultural region of "Mesogia of Attica" where production was adequate (wheat, olives, milk and vegetables); 208 were born in other regions of Greece where the living conditions were better than those in the

City of Athens, and 38 were born and had lived in the village of Laurion where agricultural products were scarce but where the drinking water contains fluorine in high amounts.

The children born in Athens were found to have the greatest incidence of dental caries. Those born in the various regions of Greece followed, and the children born in the province of "Mesogia of Attica" showed an incidence of caries approximately 40 per cent lower. But the lowest incidence was found in the village of Laurion.

When these conclusions are compared with data of previous studies conducted by the same author on children of the same age (12 and 13 years old) who were born before 1939, it appears that the resistance to dental caries of children born during the occupation was lower than that observed in children born before the war. In general, retardation in the eruption of the permanent teeth was not observed in these subjects.—*George Philippas*

The pros and cons of fluoridation

G. Neil Jenkins. *Brit. D.J.* 99:249-263 Oct. 18, 1955

Although the results of fluoridation in the six study areas on the American continent have proved that fluoride reduces caries incidence in children, the policy of fluoridation has been a highly controversial issue in America, and objections have also been raised to it in Britain. The main arguments against fluoridation are these:

1. The view that fluoride is an effective anticaries measure is challenged, or it is asserted that fluoride merely postpones caries for a few years.

2. It is potentially dangerous to put fluoride in water when only the younger age groups benefit, and it is wasteful since only a small proportion of a water supply is used for drinking.

3. There is inadequate evidence that prolonged ingestion of water containing 1 ppm of fluoride has no toxic effects, especially among the elderly, or those with kidney disease, or those with a large water intake.

4. A degree of ill health might arise from mild, chronic fluorosis.

5. The effects of fluoridation in Britain cannot be predicted because too little is known about the fluoride intake from British food, drink and possibly other sources.

6. Fluoride added to water may have a different action from fluoride present in water naturally.

This paper reviews the evidence bearing on these objections.

It has been demonstrated repeatedly that if the caries incidence is compared statistically among large, comparable groups of children with differing fluoride intakes, the incidence is lower in the group receiving the higher level of fluoride.

Evidence is accumulating which shows that although the full benefits of fluoride on caries depend on its ingestion during the calcification of the teeth, some effect is produced in later years.

Advantages of fluoridating the public water supply are that the per capita cost is only about a third that of topical application of fluoride; time is saved, and the method does not require the cooperation of the subjects.

Whether the effect of fluoride at the optimum concentration of 1 ppm consists merely of a postponement or of a permanent inhibition of caries is still unsettled because no sufficiently large survey among adults from all economic classes, ingesting this level of fluoride, has been carried out. Hallett states that any delay in the onset of caries must be welcomed as a contribution to dental health.

Spira states that fluoride may enter food and drink from aluminum cooking vessels. Dowse investigated the fluoride content of tap water after boiling for 20 minutes in new and old aluminum pans at pH's of approximately 3.0, 6.0, and 9.0. Distillates of these samples from perchloric acid gave no titration for fluoride.

Spira, in a long series of papers, has suggested that a considerable number of pathological conditions may be caused by fluoride intoxication. Held and Demole (1953), in a critique of Spira's publications, state that he made no attempt to determine the incidence in known fluoride areas of the conditions which he believes to be caused by fluoride. Held and Demole report on the incidence of seborrhea, alopecia, fragile nails, urticaria and paresthesia among 57 subjects in Sembrancher, a Swiss town with water containing from 1 to 1.4 ppm of fluoride. Held and Demole considered that their evidence did not support Spira's claims.

The Newburgh-Kingston study demonstrated that fluoridation has had no significant deleterious

effects in seven years in a large group of growing children.

Present data do not exclude completely the possibility that life-long ingestion of water containing 1 ppm of fluoride may be associated with minor ailments in the elderly, although the sum total of the medical evidence indicates that these effects are unlikely. This question could be answered conclusively only by a controlled clinical survey of the incidence of minor complaints among large numbers of elderly people who have spent their lives in a fluoride area.

An extensive bibliography is presented.

▼ Research

Survey of smoking habits of Massachusetts dentists

Leonid S. Snegireff and Olive M. Lombard. *Massachusetts D.Soc.J.* 4:7-8 July 1955

A total of 1,234 replies was received to a questionnaire sent to the members of the Massachusetts Dental Society in September 1954. Information was requested concerning the smoking habits and personal opinions of the dental profession. The survey was undertaken with the approval of the research committee of the aforementioned society, the cancer committee of the Massachusetts Medical Society and the director of the Cancer Research Institute, New England Deaconess Hospital.

Thirty-six per cent of the respondents reported they were not smoking at the time of the survey. Dentists in the age groups "under 30" and "40-49" appear to show the lowest rate of nonsmoking (28 per cent), whereas 49 per cent of the dentists over 60 years old were not smoking; 9 per cent of the dentists stated they had never smoked, and 27 per cent reported that they had smoked and had stopped prior to the time of the survey. Sixty-three per cent of the respondents stated they believed that oral cancer was influenced by tobacco; 32 per cent were undecided; 5 per cent said they did not believe there was any relationship. Thirty-seven per cent of the dentists replying to the question, "Have you noticed in your own practice whether oral cancer is related to the use of tobacco?" declared they had observed this. Ninety per cent of the respondents said they were advising their patients who were tobacco users and who had leukoplakia or hyperkeratosis to reduce their smoking. In response to the question, "Do you believe lung cancer is influenced by tobacco?" 63 per cent of the respondents replied in the affirmative; 30 per cent were undecided; 6 per cent reported their disbelief. Twenty-two per cent of the dentists replying, who are not smoking now, reported that their smoking habits were "curbed (or governed) by the possible relationship between the use of tobacco and oral cancer." Of the group of dentists who reported that they were now smoking, 14 per cent said their smoking habits had been "curbed."

A tracer study of the effect of acute and chronic exposure to sodium fluoride on the thyroid iodine metabolism of rats

N. O. Harris and R. L. Hayes *J.D.Res.* 34:470-477 Aug. 1955

Two experiments are described. The first is a study to determine the effect that an acute exposure to sodium fluoride would have on the iodine uptake gradient of the thyroid gland. Ten adult female rats were divided into two equal groups. The control group was given intraperitoneal injections of 1 ml. of saline solution containing 250 microcuries of activity as carrier-free iodine-131. Each rat was placed in a tunnel of lead bricks, a GM tube was placed over the thyroid area, and gamma radiation counts were recorded at one minute intervals for 10 minutes. The second group was similarly treated, except that 0.33 ml. of 1.25 per cent sodium fluoride in saline solution was injected intraperitoneally simultaneously with the iodine-131, although on the opposite side of the abdomen. This simultaneous injection of fluorine along with the iodine-131 produced no significant differences in uptake gradient between the two groups.

The second experiment tested the effect that a continuous fluorine intake superimposed on an iodine deficiency would have on thyroid iodine

uptake and plasma iodine level. Four groups of 12 rats each were placed on an iodine-deficient diet for 35 days, during which all had *ad libitum* access to demineralized water containing fluorine. The control group was given no fluoride. Group L received a low increment of 10 ppm of sodium fluoride, Group M received 50 ppm and Group H received 100 ppm. After 35 days the animals were given intraperitoneal injections of 1 ml. of saline solution containing 1 microcurie of activity as iodine-131. After 24 hours, each rat was sacrificed, and the thyroid glands excised, weighed and placed in 3 ml. of strong sodium hydroxide for digestion. The collected heparinized blood was centrifuged and set aside for deep-well scintillation counting. In all four groups the disintegration count for the digested thyroid and for the blood plasma was of a similar magnitude. It appears that with either acute dosage of fluorine, or chronic administration of fluorine superimposed on a dietary iodine deficiency, there is no inhibition of uptake of iodine-131, its transport to the colloid, or its eventual release into the vascular system.

▼ Preventive dentistry

Oral lesions caused by antienzyme dentifrices

William B. Simms. *U.S. Armed Forces Med.J.* 6:995-999 July 1955

Physicians and dentists are encountering a new oral lesion since antienzymes have been added to various commercial dentifrices. This entity has taken bizarre and complicated forms. The primary symptoms in most instances are an irritated, painful mouth and a tingling, sensitive tongue. Tongue sites most affected are the filiform papillae along the sulcus medianus linguae, the foliate papillae and, occasionally, the dorsum. Many patients have a painful, raw, beefy red tongue and an oral mucosa varying in appearance from a moderate redness to a severe leukoplakia. The next most frequent symptom is a denudation of the buccal mucosa. The soft palate is the third most commonly affected area; the uvula is involved only rarely.

A history of the use of antienzyme dentifrices is the most important factor in diagnosing this syndrome. Summaries of three cases illustrate the typical history, symptoms and characteristics of the syndrome.

Many people use antienzyme dentifrices without developing symptoms or lesions. It is possible that the antienzymes neutralize both the enzymes necessary to bacterial growth and those enzymes necessary to the existence of the normal oral epithelium, thus producing a condition which causes a degeneration of the surface epithelial cells.

▼ Nutrition

Dietary habits of primitive people

R. G. Willoughby. *D.Practitioner* 5:425 Aug. 1955

An investigation of the dental condition and the dietary habits of some of the primitive people who live in Australia and in New Guinea has been one of the major activities of the University of Adelaide (Australia) Dental School. Among the groups studied are those natives living on the fringe of civilization at Yuendumoo, about 180 miles northwest of Alice Springs.

The aborigines, in search for sustenance, collect grass seeds by raiding the winter stores laid up by ants; the children dig up edible roots and bulbs. The natives milk honey from a species of honey ant. Many forms of wild game are eaten almost raw. The grass seeds are ground between smooth sandstones, mixed with water to a paste, poured on a leaf or piece of bark, charred, baked in hot sand and ashes, and eaten.

Attrition of the teeth of these people is pronounced. The cusps of deciduous molars have been obliterated by the time the first permanent molar erupts. The cusps of the first permanent molar are worn flat by the time the second perma-

nent molar erupts. In old age, several of these natives have a perfectly balanced occlusion even though their plane of occlusion is the reverse of that postulated by Monson, the buccal cusps of the upper molars being far longer than the lingual cusps. There is considerable interproximal attrition, and it has been suggested by Beggs that this is responsible for the rare occurrence of malocclusion in aborigines. The periodontal condition is usually good. The normal occlusal relationship of maxilla to mandible tends with age to assume an edge-to-edge relationship. Several persons show a good functional occlusion with perfect balance in more than one position; that is, they have two distinct and different balanced functional centric occlusions.

Dentition and nutrition at Tristan da Cunha (Gebit en voeding op Tristan da Cunha)

C. C. Koets. *Nederlands Tandarts.* 10:277-280 Aug. 1955

Tristan da Cunha is the main island of a group (Tristan da Cunha Islands) in the South Atlantic Ocean and belongs to British St. Helena. Tristan da Cunha covers an area of about 45 square miles and has a population of 241 (1950), mainly descendants of shipwrecked sailors or deserters. Recently, a few European families settled there because of the newly established meteorologic station.

The inhabitants are almost self-subsistent; very little nutritional material is imported. These inhabitants, scarcely touched by "culture," are valuable objects for scientific examinations. It is an axiom that a distinct relation exists between civilized nutrition and frequency of dental caries.

In 1937 and 1938 Norwegian scientists examined the fauna and flora of Tristan da Cunha, the geologic characteristics and the general health of the population. The results were compiled in 24 monographs of which the last one is of special interest to dentistry. In this monograph, the results of clinical observations, roentgenographic tests, studies of jaws and teeth, analyses of glands and secretions, and histologic and chemical examinations of the dental structures were recorded. The report also included analyses of drinking water and nutritional materials.

Instances of dental caries in children were comparatively rare but of chronic nature. In 54 children between the ages of 1½ to 12 years, 2.8 per cent of the deciduous teeth were carious, and in this group no caries in permanent teeth was found.

The dental examination of the population between the ages of 6 and 80 years revealed a caries frequency of 7.9 per cent in permanent teeth. These figures are unbelievably low. The greatest increase in caries occurred not during puberty but in the declining periods of life. Caries appeared 50 per cent more frequently in young mothers than in young men. Also during the climacterium a high caries frequency was observed, related to the number of previous pregnancies.

Histologic investigations revealed an unusually high percentage of developmental disturbances of oral structures, again mainly in deciduous teeth.

The degree of hardness (established by rapid microdetermination) and of specific weight of the deciduous teeth were lower than for corresponding teeth of Europeans and Americans.

Many anterior teeth showed signs of mottled enamel which would be usual in regions where the drinking water contains a high fluorine content. The drinking water of Tristan da Cunha, however, contains only 0.25 mg. per liter.

The amount of phosphorus in enamel and dentin in deciduous teeth was higher than ever reported before in dental literature. Even the fluorine content in these structures was substantially higher than is found in persons consuming drinking water with such exceptionally low fluorine content. Scarcely any disease was observed in the roots. About half of the population suffered from a minor atrophy of the gums, caused either by insufficient oral hygiene or chronic irritation due to formation of serumal calculus. The alveolar bones were excellently developed.

The nutritional intake of 14 inhabitants was analyzed. The average daily value of calories was 1,227 per person, the corresponding figure in the western world being at least 3,200. The nutrition consisted mainly of potatoes, fish, lobster, meat, eggs and milk. Imported food consisted of flour (15 pounds a year) and sugar (from 5 to 10 pounds a year). The consumption of albumin, ascorbic and nicotinic acid, and phosphorus was

normal, that of vitamin A and calcium below normal. Vitamin D was provided by eating fish.

The presence of mottled enamel despite the low fluorine content in drinking water was explained by the relatively high fluorine content of fish and lobsters. This high consumption of fluorine and the low intake of carbohydrates (sugar and starch) explain the low caries frequency. Even if the nutrition was found to be insufficient for a satisfactory development of enamel and dentin, it was remarkable that the weakened dental structures proved strong enough to resist caries. The presence of *Lactobacillus acidophilus* was established, and the relationship between carious symptoms and the occurrence of this bacillus, appearing in the saliva, was noticeable.

Niacin avitaminosis: report of three cases
(Au sujet de trois cas d'avitaminosa P.P.)

R. de Vriendt. *J.D.belge* 46:184-190
June-Aug. 1955

Not many pertinent data are available on the relation of niacin (nicotinic acid-vitamin P.P.) deficiency and oral diseases. In 1762, a posthumous work by Gaspar Cazal on the study of pellagra was published in which this disease was called "pellarella," "alpine scurvy" and, poetically, "the disease of the roses." In 1867, the German chemist, C. Huber, isolated nicotinic acid. In 1870, Eyckmann discovered that this substance is essential for a healthy nutrition, its absence causing beriberi. Goldberger and Wheeler (1920) assumed that pellagra (and many other diseases) is caused by vitamin deficiency. Finally, in 1937, the conclusion was accepted that pellagra is an avitaminosis, and niacin was added to the already long list of known vitamins.

The essentiality of niacin for development and growth of cells was clearly established by animal experiments. The failure of growth in experimental animals was reflected in changes occurring to the epiphyseal plate on which the growth of the long bones depends. The alveolar bone is especially sensitive to all alterations in function and to dietary deficiencies. The process of normal calcification depends on the natural formation of a protein matrix, serving as a basic substance in which mineral salts are deposited. The failure to calcify seems, therefore, to be the result of an inadequate matrix synthesis.

Many of the symptoms of niacin avitaminosis in the reported three cases resemble the phenomena of vitamin B_6 deficiency: inflammation and eczemas of the lips, sensation of burning, shedding of epithelial tissue in the nasolabial region and around the ears, seborrheic dermatitis in the oral cavity, and vascularization of the cornea. Also present were the specific symptoms of niacin avitaminosis: cutaneous pellagral condition, disturbances in the oral cavity such as glossitis and stomatitis accompanied by aspects of lichen planus, edemas and congestion of mucous membranes, enteritis, colitis, proctitis, and also mental monosymptomatic phenomena, making a correct diagnosis difficult.

The three patients, women 18, 22 and 67 years old, presented these symptoms in different variations, the last one showing also signs of ariboflavinosis. The treatment consisted of the intramuscular injection of nicotinic acid and medication of riboflavin, and the usual therapy applied in stomatitis. In the second patient a complicated extraction of seven involved teeth was necessary, in which instance penicillin (250,000 units) was given. The therapy lasted two weeks, and an improvement was achieved in all three cases. The findings afford circumstantial support to the theory that a close etiologic relationship exists between niacin avitaminosis and other deficiency diseases such as pellagra, scurvy and vitamin B_2 deficiency.

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Dental health education

A program of dental health in Nebraska schools

H. W. Heinz. *J.Nebraska D.A.* 32:15-17
Sept. 1955

It is estimated that 80 to 95 per cent of the children in Nebraska have decayed teeth. The aims and objectives of dental health education in

Nebraska schools are: (1) to arouse dental health consciousness; (2) to present sound principles of nutrition; (3) to create an appreciation for early and regular dental attention, and to establish the habit of home care of the teeth, and (4) to stress the relation between dental health and general physical well-being.

The child is the key person in the success of the program. He must learn to eat the right foods in proper amounts, and must keep his mouth clean and healthy day by day. The concerned parent administers the first care of the child's teeth, provides the toothbrush and cleansing agents, instructs the child in their use, and sees that the child visits the dentist regularly. The teacher gives instruction in general dental health, gives training in health habits, urges the routine practice of oral hygiene, motivates the child to seek regular dental health care, and may detect conditions that demand immediate dental attention.

Dental inspections made by teachers, nurses, physicians and even dentists in the school room are poor substitutes for good dental examinations made by dentists in their offices. Some states and many cities have ruled that children may be excused during the school day for health appointments, a commendable policy, since an appointment with the dentist is a valuable learning experience and a desirable habit to develop.

Effective dental health education should show an increase in the number of children who (1) have corrections made at regular intervals, (2) receive dental corrections at an early age, and (3) have all necessary dental corrections made during a given year. The director of dental health in the Nebraska State Department of Health welcomes conferences with teachers, and will supply educational material directly to schools, free of charge.

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Etiology

The color of the teeth: its relationship to caries susceptibility (Boja zubi i sklonost karijesu)

M. Dobronéc. *Zobozdrav.vest., Ljubljana* 10:87-96 May-June 1955

An investigation was made as to whether the natural color of the teeth has any influence on susceptibility or resistance to caries. More than 1,000 Yugoslavian school children of both sexes and between 10 and 19 years old were examined. The presence and condition of deciduous and permanent teeth were recorded, but in the age groups of 12 and above, only permanent teeth were included in the calculation. According to the calorimetric method, by use of the calorimeter, the teeth were classified in white, grey, yellow and brown tooth groups. The conclusions were as follows: White and grey teeth are less resistant to caries than yellow or brown teeth. The age of the children has a higher correlation than has specific tooth color in susceptibility or resistance to caries. There is a certain correlation between natural development, growth and nutrition of the examined children and their susceptibility or resistance to caries. The association between pigmentation of the skin and caries resistance seems insignificant. There also is no relation between sex and susceptibility to caries. Comparative studies seem to prove, however, that a certain relationship exists between tooth color and caries resistance. The importance of the tooth color in caries disposition (as shown in the white and grey tooth groups) is limited by the unquestionable presence of many other as yet unknown factors.

Doctoral and Masters' dissertations

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In this column each month are listed recent Doctoral and Masters' dissertations of dental interest, accepted by the dental schools or graduate schools in partial fulfillment for advanced degrees. Copies of many of these theses are available from the schools through interlibrary loan.

An investigation to determine the effects of starch sponge implanted in bone. *Leo Korchin. 1954.* M.S. *Georgetown University.*

Cephalometric appraisal on the results of treatment of Class II Division I cases. *Albert L. Miller. 1954.* M.S. *St. Louis University.*

Heredity's part in tooth size as observed in twins, siblings, and non-blood related individuals. *Jose M. Rivera. 1954.* M.S. *St. Louis University.*

A controlled cephalometric analysis of facial growth in children with cleft palate. *John J. Byrne. 1955.* M.S. *St. Louis University.*

The healing of tooth root-fractures. *William D. Baker. 1955.* M.S. *St. Louis University.*

A study of stress pattern variations in buccolingual sections of Class II cavity restorations as a result of different cavity form. *William F. Guard. 1954.* M.S.D. *University of Nebraska.*

A study of age changes in the pulp tissue of the primary teeth. *William C. Day. 1955.* M.S.D. *University of Nebraska.*

Relations between jaw opening power and mandibular morphology. *Carlos Ganoza. 1953.* M.S.D. *University of Minnesota.*

Electrophoresis in dentin with radioactive isotope calcium 45. *Robert Earl Sausen. 1953.* M.S.D. *University of Minnesota.*

Serial study of dental eruption during later childhood. *Joseph Wilson Janda. 1953.* M.S.D. *University of Minnesota.*

Studies with hyaluronidase in the removal of lower third molars. *Philip Theodore Fleuchaus. 1954.* M.S.D. *University of Minnesota.*

Effects of diaphragms on x-radiation in dental units. *Eugene Edward Petersen. 1954.* M.S.D. *University of Minnesota.*

Studies of socket healing with alizarine red S vital dye in the jaws of hamsters. *Robert Howard Linn. 1954.* M.S.D. *University of Minnesota.*

A histopathological study of the post area of implant dentures. *Milton Leon Westerberg. 1954.* M.S.D. *University of Minnesota.*

An evaluation of Efocaine. *Paul Eugene Jurgens. 1954.* M.S.D. *University of Minnesota.*

Reproducibility of radiographic recordings of rest position of the mandible in young adults. *John Howard McNutt. 1954.* M.S.D. *University of Minnesota.*

The effect of hypophysectomy on mitosis in the periodontal membrane. *Marmion Wendle Houglum. 1955.* M.S.D. *University of Minnesota.*

The efficiency of various root canal medicaments to effectively seal dentinal tubuli. *Hobart Philip Lundblade. 1955.* M.S.D. *University of Minnesota.*

A study of the endodontal bacteriological findings and clinical treatment of abscessed deciduous and young permanent teeth. *Vimla Sud. 1955.* M.S.D. *University of Minnesota.*

A roentgenographic investigation of the effect of orthodontic treatment on the relationship of the alveolar bone proper to the cemento-enamel junction. *Donald H. Baxter. 1954.* M.S. *University of Washington Graduate School.*

A serial cephalometric study of children with excellent occlusion using angular and linear measurements. *John Q. Barnes. 1954.* M.S. *University of Washington Graduate School.*

A study of the incidence of malocclusion and facial characteristics in Seattle high school students aged fifteen to twenty years. *Samuel R. Blake. 1954.* M.S. *University of Washington Graduate School.*

A serial cephalometric study of the rest position of the mandible on patients with excellent occlu-

sions. *Eugene F. Butori. 1953.* M.S. *University of Washington Graduate School.*

A serial cephalometric study of the rest position of the mandible on edentulous individuals. *J. A. R. Coulombe, Jr. 1953.* M.S. *University of Washington Graduate School.*

An analysis of dental casts of patients made before and after orthodontic treatment. *Aldo A. Dona. 1953.* M.S. *University of Washington Graduate School.*

A cinefluorographic evaluation of the results of orthodontic treatment of Class II, division I malocclusions which previously exhibited posterior translation of the mandible and a study of the spatial relationship of the hyoid bone. *John V. Drake. 1954.* M.S. *University of Washington Graduate School.*

A dentofacial study of Seattle high school students aged fifteen to twenty years. *Kenneth E. Gibbs. 1954.* M.S. *University of Washington Graduate School.*

A cephalometric evaluation and comparison of two methods of treatment of Class II malocclusion in the mixed dentition. *William C. McGovern. 1954.* M.S. *University of Washington Graduate School.*

A cross-sectional study of vertical facial dimensions of children with excellent occlusions. *Raymond W. McNair. 1953.* M.S. *University of Washington Graduate School.*

A cephalometric evaluation of Class II malocclusions in the mixed dentition treated by occipital anchorage. *Archie E. Peterson. 1954.* M.S. *University of Washington Graduate School.*

Comminuting effectiveness of artificial nonanatomic posterior teeth. *Thomas J. Riley, Jr. 1953.* M.S. *University of Washington Graduate School.*

A study of angular relationships of the mandibular incisors. *Kenneth M. Roberts. 1954.* M.S. *University of Washington Graduate School.*

An analysis of tooth size, tooth position, and size of supporting area. *Robert F. Taylor. 1953.* M.S. *University of Washington Graduate School.*

An evaluation of several methods used to analyze the severity of dentofacial relationships. *Gordon K. Johnson. 1955.* M.S. *University of Washington Graduate School.*

A serial cephalometric analysis of the skeletal and denture patterns of children with excellent occlusions. *Lowell C. Lundell. 1955.* M.S. *University of Washington Graduate School.*

A study of dentofacial changes produced by occipital traction in Class II malocclusions. *Joseph R. Moran. 1955.* M.S. *University of Washington Graduate School.*

A roentgenographic anthropometric evaluation of the mandibular apical base. *Donald A. Rudee. 1955.* M.S. *University of Washington Graduate School.*

A serial cephalometric study of children at 12 and 16 years of age having excellent occlusions. *Jerold D. Schulz. 1955.* M.S. *University of Washington Graduate School.*

A study of the incidence of defective speech in cases of open-bite malocclusion. *Eugene W. Supernow. 1955.* M.S. *University of Washington Graduate School.*

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